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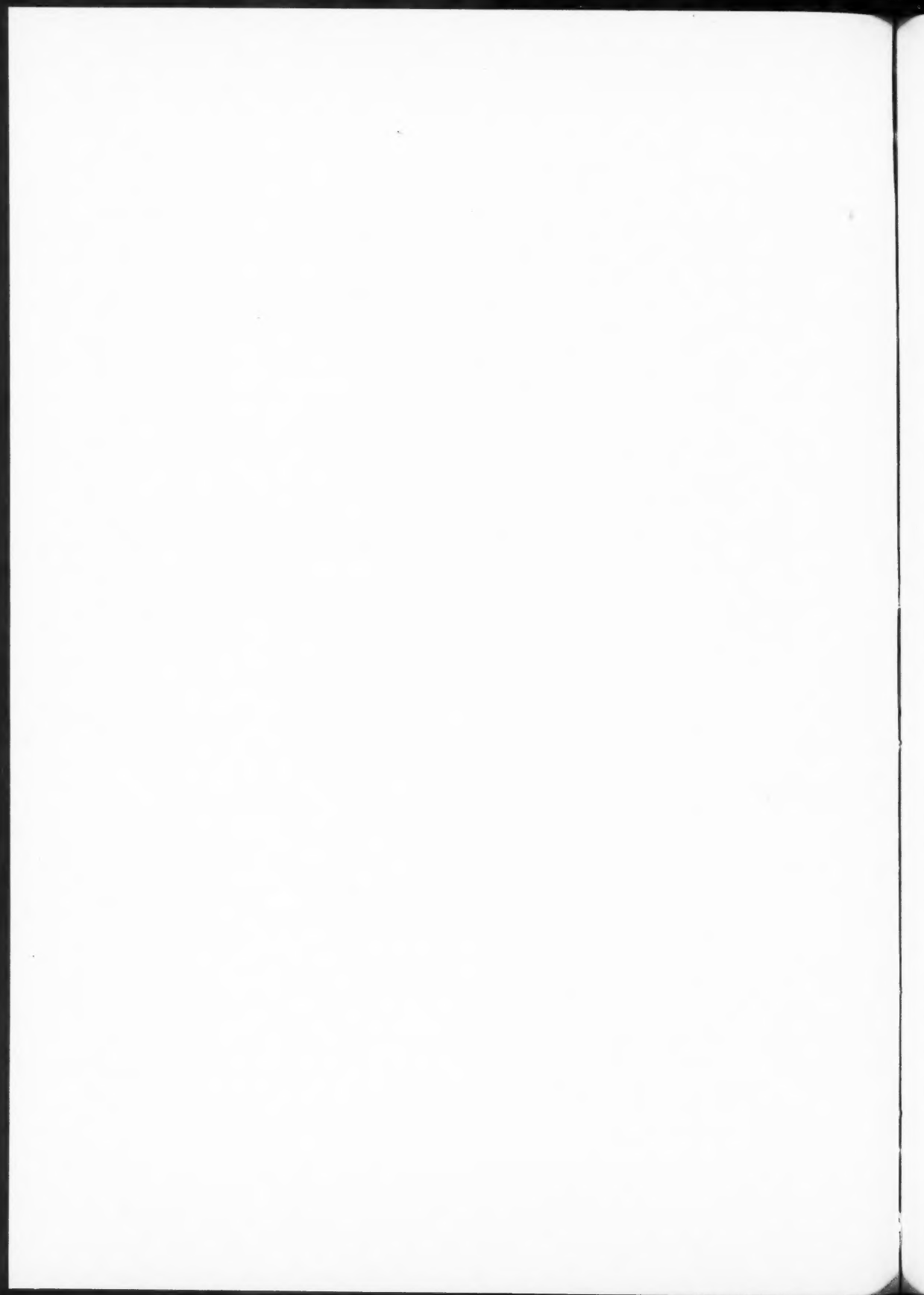
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of current materials on economic and social development

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CONTENTS

Volume XI, Number 2

April, 1973

LAW OF THE SEA

WHO GETS WHAT ON THE SEABED? Evan Luard	3
SUBSEA OIL AND GAS RESOURCES V. E. McKelvey and Frank F. H. Wang	12
RECENT CONCEPTS IN UNDERSEA MINING John L. Mero	14
THE POLITICS OF THE OCEAN Charles Maechling, Jr.	19
A LAW OF THE SEA CONFERENCE: WHO NEEDS IT? Robert L. Friedheim	25
LAND-LOCKED STATES AND THE LAW OF THE SEAS Patrick Childs	31

MONETARY REFORM

THE NEED FOR REFORM IN THE INTERNATIONAL MONETARY SYSTEM Executive Directors of the International Monetary Fund	41
SPECIAL DRAWING RIGHTS: \$10 BILLION FOR WHOM? James W. Howe	48
THE USE OF SPECIAL DRAWING RIGHTS BY DEVELOPING NATIONS Danny M. Leipziger	56
AN AGENDA FOR MONETARY REFORM Tom de Vries	61

EXCHANGE RATE FLEXIBILITY AND THE DEVELOPING COUNTRIES Danny M. Leipziger	71
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NUTRITIONAL PLANNING

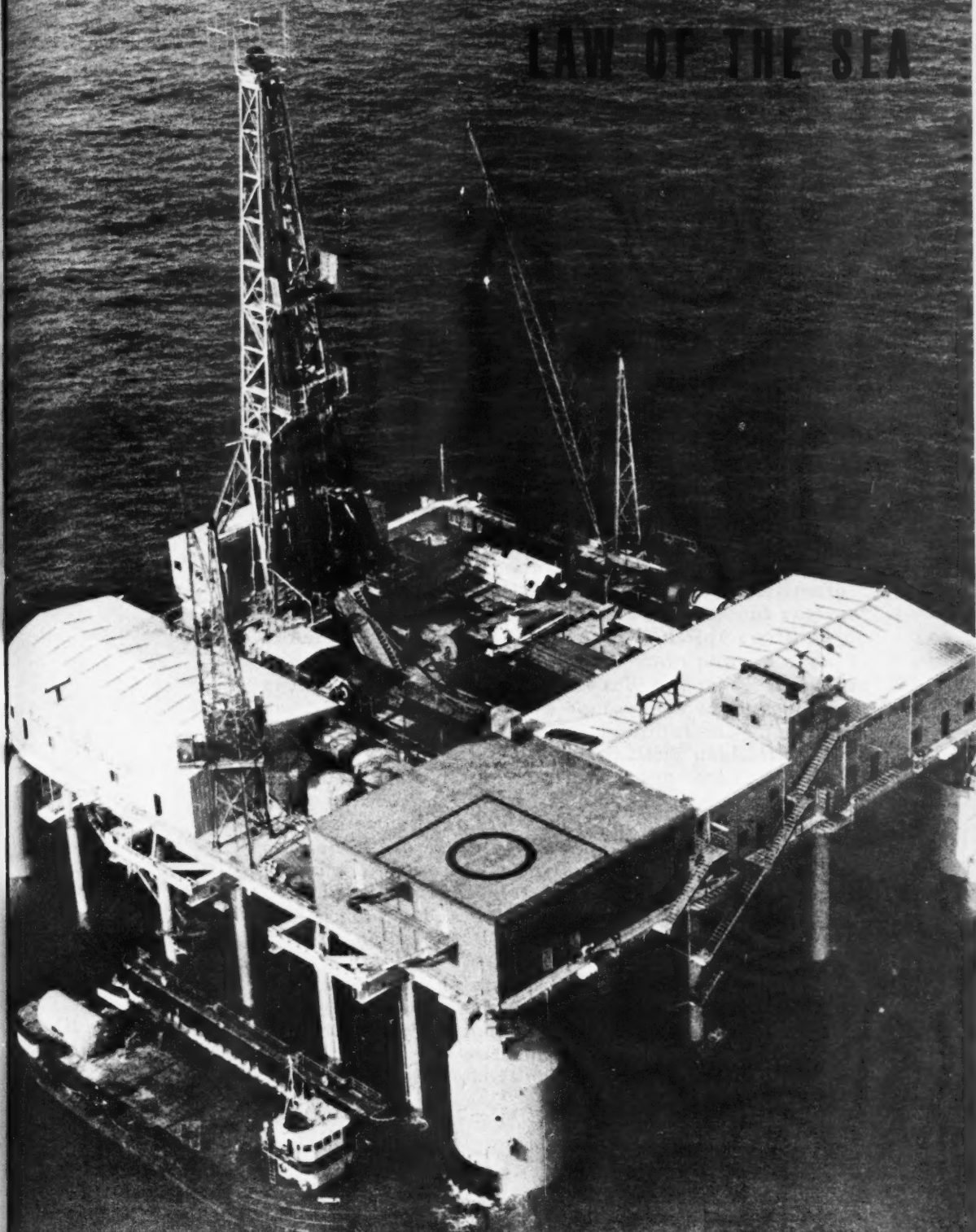
THE EFFICIENT USE OF WORLD PROTEIN SUPPLIES John C. Abbott	77
MEETING NUTRITIONAL NEEDS THROUGH COMMERCIAL CHANNELS Bo Wickström	87
LESSONS FROM THE INDIAN EXPERIMENT Alan Berg	93

DEVELOPMENT MEASURES

WHAT ARE WE TRYING TO MEASURE? Dudley Seers	109
SOCIAL VALUES AND THE GNP The Editor	120

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LAW OF THE SEA



FLOATING OIL-DRILLING VESSEL
TAPS SEABED PETROLEUM RESERVES.
[PHOTO: ARMCO STEEL CORPORATION]

Who Gets What on the Seabed?

Evan Luard

[The question of who controls the seabed is the subject of hot debate among nations of the world. A Law of the Sea Conference in 1973/74 will try to resolve the many issues concerning utilization of seabed resources. An international regime to regulate resource development should be established to permit all nations equitable access to the wealth of the sea.]

Almost five years ago the United Nations began to discuss the issue of the seabed. But only a rather optimistic observer could conclude that a great deal of progress has yet been made towards the ultimate utopia to which all aspire: "an international regime" for seabed operation. At least the major conflicts of interest and attitudes among the main powers and groups have become more clearly exposed, and plans are being made for a 1973 conference to draw up a treaty on a system of seabed exploitation. Why has this question so far received so little publicity? It is possibly the most important issue that has ever come before the United Nations. It concerns, after all, the ownership and control of a substantial proportion of the earth's wealth. The seabed covers 70 percent of the earth's surface and some believe it contains resources more valuable than those remaining on land. It is thus a major matter to know to whom they belong.

The resources are situated in an area that until recently had been regarded as no man's land: an international zone beyond all national jurisdiction. But even if that were still universally accepted, what does it mean? Can anybody pick up what they can find on

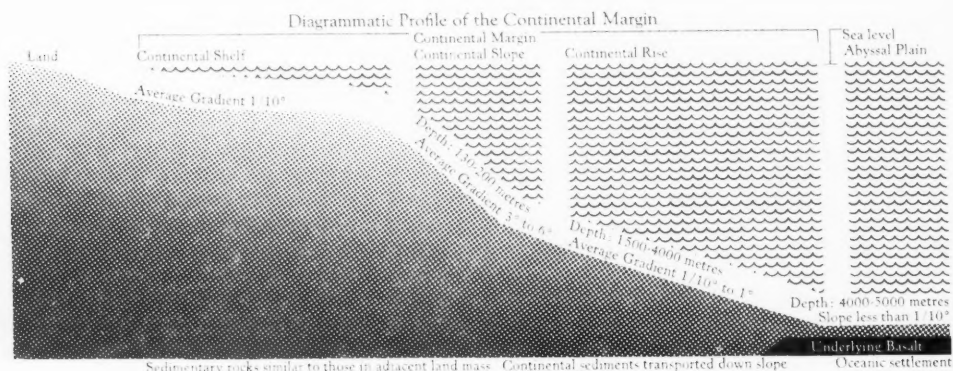
Mr. Luard teaches international relations at Oxford University, Oxford, England.

the sea floor, on the theory that finding is keeping? This would mean that only the most advanced nations, with an advanced technology, would be able to benefit. Does it mean that coastal states should be able to extend their jurisdiction outwards indefinitely, and thus reserve exploitation of resources to themselves alone? This would mean that non-coastal states would be left out altogether, while the rest would benefit according to length of their coastline. Or does it mean that the resources should be regarded as international, belonging equally to all, to be exploited only on an internationally agreed basis, perhaps under the direction of some international authority set up for the purpose? Though the most widely accepted view, this raises complicated questions about what system to use.

These are the basic issues. But there are a number of related questions which are almost equally important. Should national rights in the waters off the coasts, that is, fishing rights, be extended outwards also, perhaps to the same distance as rights in the seabed? Would this in turn require the extension of all other rights on the surface as well? Does the control of pollution also require the extension of national jurisdiction or some type of international control for the purpose? What limitations, if any, are necessary over military uses of the seabed? If the limits of the territorial sea are extended, how should freedom of navigation be protected in straits and other coastal waters? And so on. It can scarcely be wondered, seeing the variety and complexity of the issues, that discussion has not yet progressed very far. The real question, given the size of the stakes and the sharply conflicting interests of different nations and groups of nations, is: will it be possible to reach agreement at all? And if not, what then?

The Continental Margin

Adjoining the coast there exists a strip where the land slopes down beneath the sea, on a relatively shallow incline, until it reaches a point where it begins to slope more sharply (see diagram). That

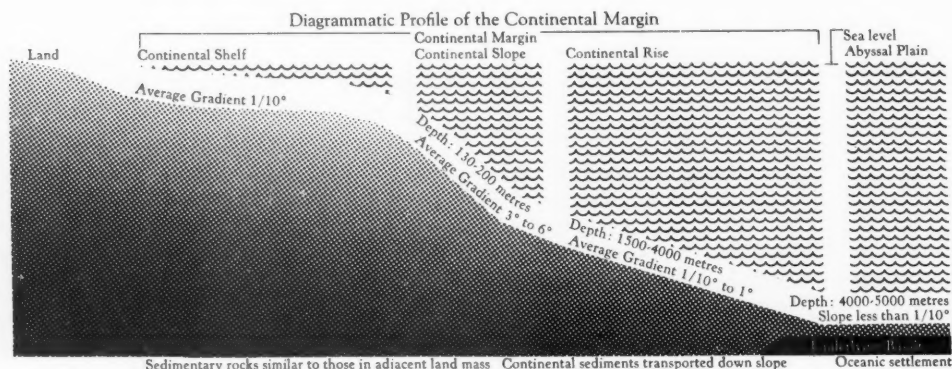


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point usually comes at a depth of 130 to 200 meters, though sometimes it is at 50 meters and occasionally as deep as 500 meters. In width this strip varies from a mile or two to 600 miles, according to the steepness of the slope. The area is known by geologists as the continental shelf (this is the geological definition—we shall consider the legal definition later). Beyond it there exists a further area, the continental slope, where the incline is much steeper. This is relatively narrow in width, often not more than 20 miles, and extends down to a depth of 2,000-2,500 meters. Beyond that again, where the incline becomes shallow once more, there is the continental rise, sloping down to the abyssal plain, the bottom of the ocean, which averages around 4,000 meters in depth. But this plain is far from flat, containing sea-mounts and peaks reaching to the surface of the water, and trenches going down at the deepest to around 11,000 meters. The shelf, the slope and the rise together are known as the continental margin. It is within this margin that most of the organic materials of the oceans—for example, oil and gas—are likely to be found.

The Resources

The seabed is now known to contain a variety of materials, all of which may become economically important over the next few years. Some are at present fairly marginal. There is phosphorite, a form of phosphate which can be used as fertilizer, and is already recovered in some shelf areas. There are deposits of tin and other minerals near the surface of the seabed, already exploited by dredging off the coasts of Thailand and Malaysia. There are diamonds, now being recovered off the coast of southwest Africa. There is magnesium and potassium; sand and gravel, which is at present the resource most widely exploited; and salt. And there are the newly discovered "hot brines," sediments that are very rich in a number of minerals, found where fissures in the seabed have allowed them to seep out from the earth's interior.

But there are two groups of resources that are of far greater significance than any of these. The first are the hydrocarbons—oil and gas, now being exploited at ever-increasing depths. At present most production takes place at depths of less than 100 meters, that is well within national waters. But already exploration is common in waters 400 meters or more in depth, and by 1975 production too will be occurring at depths of over 200 meters. As the depth of production increases, costs rise sharply. Despite cost increases however, seabed production of oil, even at great depths, remains attractive for a number of reasons. The world demand for petroleum products is growing very rapidly. For the coastal states which import oil, seabed production can eliminate some of the transportation costs which make up a large proportion of total oil costs. The

costs of payments to producer governments have risen sharply in the last few years; production in a country's own continental shelf eliminates these. There are, of course, important balance-of-payments savings for the consumer country if it can produce oil in its own shelf area, and finally, there are the obvious strategic gains for the nation which can minimize its dependence on external sources of oil. For all these reasons, an increasing number of oil companies are now extending production into deeper water. In so doing they will shortly be reaching out well beyond the basic limits of national jurisdiction laid down in the 1958 Convention.

These trends are even more important in relation to gas. There is no real danger that land sources of oil will be rapidly exhausted in the near future. But in the case of natural gas this is a genuine possibility, at least in certain areas. The United States at present consumes more than one half the world's natural gas, mainly from sources inside the country. But U.S. deposits will be almost exhausted within a decade or so. There will undoubtedly be a big switch to undersea supplies.

There is another seabed resource which may be of still greater significance: the so-called manganese nodules. These are small potato-sized lumps of metal, irregular in shape, brownish or black in color, which are scattered about large parts of the seabed, especially in the deeper areas, in the Pacific, Indian and Atlantic Oceans. Though largely composed of relatively unimportant minerals such as iron and silicon, they also contain considerable proportions of valuable metals—especially manganese, but also copper, nickel and cobalt. The nodules are scattered in such profusion that, once satisfactory processes are devised for dredging them up, and for separating out the different minerals, they could be as important a source of supply as are mines on land. Dredging apparatus has already been designed and demonstrated, both by Japanese and American companies, that is capable of bringing up nodules from 3,000 and 4,000 meters in depth, in volumes sufficient, it is claimed, to make production profitable. Similarly, it is claimed that processes for separation have been devised which would make possible the extraction of the more valuable minerals at a competitive cost. One U.S. company, Deep Sea Ventures, claims that it will be in a position to begin regular production by 1975. Japanese companies are making equally optimistic predictions. If such production were to begin, it could represent a considerable proportion of the total supply of these metals.

To Whom Do the Resources Belong?

Until recently few countries were interested in asserting rights in seabed areas. It is only in the last 20 years or so, therefore, that

international law has begun to consider the matter at all. Rights in the seabed were for long thought to be synonymous with those on the surface of the sea: to three, six or 12 miles from the shore, according to whatever were the claims maintained by the coastal state. From the last century onwards, the coastal state was also accorded certain rights in the sub-soil beyond, for example if it wanted to sink tunnels, or lay cables, so long as freedom of navigation was not affected. Only at the end of the Second World War were more sweeping claims in the seabed made.

In 1945 President Truman asserted, on behalf of the United States, claims to exploration and exploitation rights (but not sovereignty) within the "continental shelf." This term was not exactly defined, but was assumed to correspond with the geological shelf. There was little opposition to this move at the time, and many other coastal states followed suit. But since the geological shelf was an extremely imprecise term, it began to be important to formulate a more exact definition of the limits of national rights. From 1950 on, the International Law Commission began to consider the terms of a convention that would give a legal definition to the continental shelf. This was finally adopted in the Convention on the Continental Shelf, which was adopted at the Conference on the Law of the Sea in 1958. Unfortunately the definition was highly ambiguous. The area was to be "adjacent to the coast," and within the 200-meter depth limit. But it went on to qualify this in a way which left it open-ended: "or beyond that, to where the depth of the superjacent water permits of exploitation." In other words a country could claim the continental shelf up to any depth, it seemed, so long as exploitation was possible there.

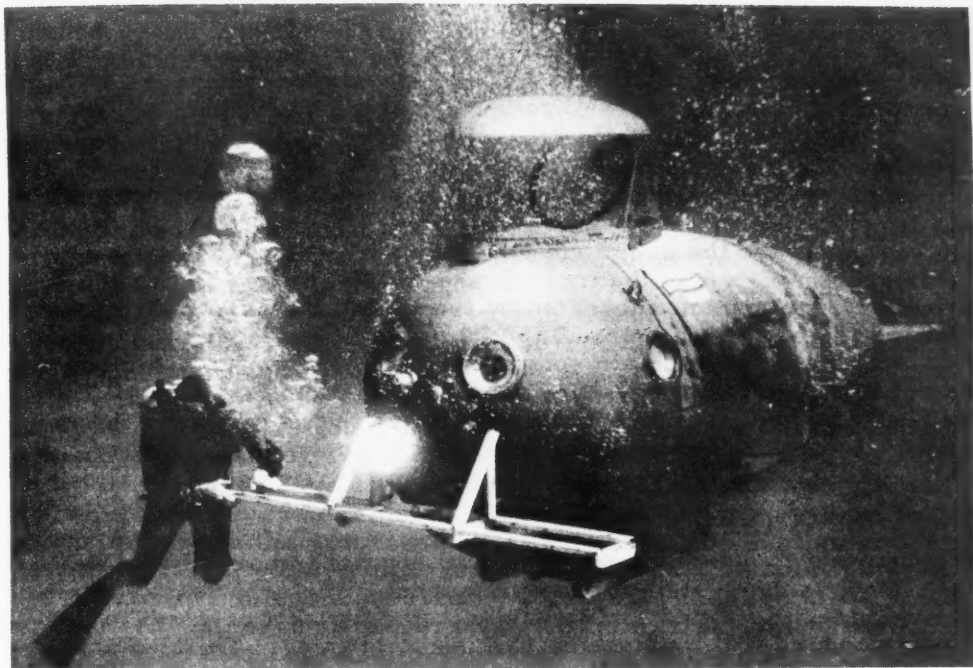
This qualification seems to have been intended to cover the cases where there is a deposit of oil that lay partly within and partly beyond the 200-meter line. It confirmed the rights of the coastal state in such a situation, and prevented a company from a technologically advanced state suddenly appearing to suck such a reservoir dry from the outer side. But if "adjacency" was loosely interpreted, it could allow the coastal state to extend its shelf indefinitely until it reached the mid-point of the ocean, or to go even beyond that (so long as it could exploit) to the point on the opposite side where the next coastal state was able to do so. Advances in undersea technology in the last few years have made havoc of this definition. If nodule dredges come into operation which are capable of operating in 3,000 or 4,000 meters of depth, any coastal state might be able to claim, on the basis of the 1958 definition, large parts of the ocean bed lying off their coasts, on the basis that they could, if necessary, be exploited. The whole seabed, and all its vast resources, could thus conceivably be parceled out to the complete exclusion of the non-coastal states.

This was only one, though perhaps the most important, of a number of issues concerning boundaries. Another concerns the surface of the water. Over the last 20 years a number of states, especially in Latin America, have asserted claims to fishing rights, other jurisdiction, and in some cases sovereignty, to a distance of 200 miles. China has now joined this group. They argue that, since the United States and other countries made unilateral claims to neighboring resources on the sea floor some 25 years ago, why should they not do the same in relation to sea resources today? Some of them have little shelf or seabed resources, but have particularly valuable fishing grounds off their coasts. Other problems concern the limits of jurisdiction for the purposes of pollution control (Canada has recently claimed a 100-mile limit for this purpose); rights of navigation through straits; rights of navigation for warships in territorial waters and straits; rights of archipelago countries to draw boundaries around the outermost parts of their islands; the right to claim shelf areas based on small islands (Britain has recently asserted claims of sovereignty over Rockall, a tiny speck of rock in the Atlantic, in order to be able to claim the extensive shelf areas that slope from it, while Japan, China and Taiwan are in conflict over some uninhabited islands in the China Sea for the same reason); and so on. These and a few other questions (the right to archeological treasures in the seabed is a picturesque example) are now under discussion in the Seabed Committee of the United Nations General Assembly. In short, there is no lack of complicated and contentious legal issues, but the most basic problem concerns the regime for seabed exploitation.

Law of the Sea Conference

In 1970 a decision was made to call a full-scale international conference, "in 1973 if possible," on the law of the sea and the international regime. This is a vast agenda, including all the most controversial questions of sea law which have remained undecided for years, from the width of the territorial sea to the huge and complex question of a seabed regime. The Seabed Committee, preparing for the conference, has only just managed to reach agreement on the list of subjects to be discussed, let alone discussing the terms of the articles and conventions themselves. It is thus difficult to believe that a constructive conference on these issues could take place by 1973. For such a conference to succeed, all except the most basic issues would have to be largely tied up in advance, and that stage is a very long way off. It seems likely that there will be a series of conferences in coming years.

On some issues the beginnings of a compromise can be discerned. On the breadth of the "territorial sea," there has been a strong move in the last few years (even in Latin America) towards a general ac-



ABOVE: Two-man research sub, the Asherah, probes the marine and geological mysteries of the sea and ocean floor. [Photo: General Dynamics, Groton, Connecticut]

ceptance of 12 miles. The rich nations will probably have to accept the idea of some kind of "economic zone" or "preference zone," extending further from the coast, in which the coastal state would have exclusive or preferential rights for fishing, and perhaps for seabed resources as well. There is an increasing disposition to define the continental shelf, that is, the limit of coastal jurisdiction over seabed resources, in terms of distance rather than depth; and it is theoretically possible and politically attractive (especially to many developing countries) to provide the same limit for seabed rights as for those on fishing. Such a limit might be set at 50 miles from the coast. Rights of free navigation within that area would have to be preserved and defined. This would be the simplest, and perhaps the best, type of solution on limits. It would represent a reasonable compromise between the minimalists, at present holding out for a three-mile territorial sea and freedom of fishing beyond, and the maximalists claiming limits of 200 miles for all purposes. And it would be a fair assessment of the interest which coastal states can legitimately claim in the resources of the oceans off their shelves.

More difficult problems surround the nature of the international regime. First, the authority clearly cannot be established on the basis of majority voting and one nation-one vote (if only because the

big powers would not enter at all on this basis); neither should any nation or small group of them (as under the U.S. proposals) exercise a veto. The simplest solution is to have a council of perhaps 30 nations, elected on the basis of geographic representation, and including adequate representation for non-coastal states, and to require, say, a four-fifths majority for any decision. This would maximize consensus without allowing vetoes or weighting votes.

Harder still are the questions relating to the scale of royalties and the system of redistribution. There is a lot to be said for the intermediate zone system suggested by the United States and Malta. This zone might stretch from 50 to 100 miles from the coast: in it the coastal state would retain some degree of control but would pay a considerable part of the royalties to the international authority. The effect is to reduce the sharp division between the national and the international area. This lessens conflicts on boundaries by asking coastal states to share resources, rather than to forego them altogether.

There are two questions which will be of vital importance. One of these concerns the system of licensing under an international regime. It is now widely assumed that licensing authority will be given to governments, which will themselves license companies. This reflects the fact that it is governments that are deciding the question. But it may be the worst possible system. It would provide a multiplicity of separate regulations and jurisdictions in a peculiar patchwork all over the seabed. It would make effective pollution control difficult to enforce. It would maximize disputes over boundaries of seabed blocks. Further, it would maximize the power of the big companies. They would be in the position of selling their skills to 135 different governments, most of them without technological capability, competing strongly with each other to secure the companies' services. If, on the other hand, licenses went direct from the international authority to the companies, the negotiating position would be reversed; they would then be competing with each other to acquire concessions from the authority. This latter method is therefore one that could maximize revenues for the international system, and for the international community generally. It would be ironical if the nationalist aspirations of developing governments to acquire their own seabed had the effect of putting them at the mercy of the big corporations which they say they most fear.

The second vital question concerns the outer limit of national control. Here there is an absolute conflict of interest between the coastal and non-coastal states. There is a real danger that the coastal states, perhaps encouraged by the Latin American example, may increasingly jump on the 200-mile bandwagon to grab the largest possible proportion of the resources for themselves. This

would largely exclude the non-coastal states from sharing in the revenues and other benefits of seabed resources, at least of oil and gas for the foreseeable future. It will thus be an interesting test whether some of the bigger developing countries, such as Brazil, Argentina and Chile, are willing to show in their policies the same concern for poorer neighbors that they demand the rich countries show them. Land-locked countries are mainly very poor: of the 25 "least developed" countries recently defined by the United Nations, about half are land-locked. If they are to gain any benefit from resources that cannot reasonably be regarded as the property of any one state, the coastal limit must not be too wide. The 50-mile limit suggested here is roughly the average distance of the 200-meter depth line from the coast all over the world, and would thus seem a reasonable compromise.

The system that would bring the greatest benefit to developing countries in general would therefore be one that provides for a narrow boundary, and for international licensing direct to companies. This is also the system that would represent the most significant step forward in the present international system. The opportunity is provided here to establish for the first time a form of international control of common resources. This would open the possibilities of rational utilization, preservation of the international environment, and even redistribution to poorer countries. It would be unrealistic, however, to hope that any government is likely to be much influenced by idealistic concern for the international community in the decisions they reach. But even national decision-makers may be conscious of the need to set up a system that will prove stable and secure. Such a system can exist only if it has obtained the good will of most governments of the world. Consensus remains important to all therefore. The rich countries, as well as the poor, will have to give as well as take if a viable seabed system is to come into operation.

[Excerpted from "Who Gets What On The Seabed?" Foreign Policy. New York: National Affairs, Inc., No. 9, Winter 1972/73, pp. 132-140 and 143-147.]

Subsea Oil and Gas Resources

V. E. McKelvey and Frank F. H. Wang

[The seabed contains a large part of the world's oil and gas potential—indeed seabed petroleum resources may exceed those of the lands. Offshore areas with some possibility of production are located near many countries, but only a small fraction of the total area has actually been explored.]

Subsea petroleum (oil and gas), produced offshore in 25 countries, presently contributes 17 percent of the world's output and makes up nearly 90 percent of the total value of current subsea mineral production. Through the remainder of the present century and probably longer, petroleum will continue to be the principal mineral produced from the seabed. Offshore sources may come to supply 30-35 percent of the world's petroleum production by 1980, and the annual value of subsea petroleum production probably will soon exceed that of all other marine resources combined, including seawater chemicals and fish.

Petroleum resources are largely confined to the continental shelves, continental slopes, continental rises, and the small ocean basins. Because these areas in general contain a greater thickness of the sediments from which most of the world's petroleum production comes than do the lands, the undersea shelf and slope areas taken as a whole are more favorable for petroleum than the exposed parts of the continents. Environments favorable for petroleum are highly localized; and only a small part of the broadly favorable areas actually contain producible petroleum accumulations. Although the geologic areas within

Drs. McKelvey and Wang are with the U.S. Geological Survey, Department of the Interior, Washington, D.C., and Menlo Park, California, respectively.

continental margins and small basins are the only ones that can be identified now as broadly favorable for petroleum, the possibility that it also occurs in other parts of the ocean cannot be ruled out.

Current offshore petroleum production comes from water depths of less than 105 meters and from areas within 120 km of the coast. The technological limit of offshore petroleum production, however, may be extended to water depths of as much as 6,000 feet (1,830 m) by 1980, although at much higher costs. Because of the higher cost, production from areas beyond the 200-meter isobath is likely to be largely restricted during the next decade to giant fields in the most favorable locations and probably will not amount to more than 0.5-1.0 billion barrels a year by 1980.

No complete estimates of potential world subsea petroleum resources have been made, but enough is known to be certain that they are large, perhaps even larger than those of the continents. World subsea proved recoverable reserves are 90 billion barrels. L. G. Weeks estimates that world "offshore petroleum resources" (including proved reserves) beneath a water depth of as much as 1,000 feet (300 m) amount to 700 billion barrels of petroleum liquids, plus 350 billion barrels recoverable by secondary methods, and the equivalent of 350 billion barrels in natural gas.

Areas favorable for the local occurrence of subsea petroleum resources lie adjacent to nearly every coastal nation. Geologic or geophysical exploration is already underway off the coast of more than 75 countries and drilling is in progress off 42 of them. Wide shelves, where petroleum in large accumulations, if they are present, can be recovered economically now, occur off the coasts of Greenland, Norway, the United Kingdom, Canada, Mexico, Trinidad-Tobago, Venezuela, Guyana, Surinam, French Guiana, Brazil, Uruguay, Argentina, Australia, New Zealand, mainland China, Korea, Taiwan, and the Soviet Union as well as along the Atlantic, Gulf of Mexico, and Alaskan coasts of the United States. The continental rise is especially wide in the Arabian Sea, the Bay of Bengal, off eastern Africa, off most of western Africa, and off much of the eastern coasts of North America and South America. Small ocean basins that have a large petroleum potential include the Gulf of Mexico, the Caribbean Sea, the Mediterranean Sea, the Black Sea, the Caspian Sea, the Bering Sea, the Sea of Okhotsk, the Sea of Japan, the South China Sea, and the seas within the Indonesian Archipelago.

[Excerpted from World Subsea Mineral Resources, A Discussion to Accompany Miscellaneous Geologic Investigations Map I-632, Washington, D. C.: Department of the Interior, U. S. Geological Survey, 1969, pp. 8-9.]

Recent Concepts in Undersea Mining

John L. Mero

[Mining companies have begun exploring widespread deposits on the deep sea floor of nodules rich in manganese, copper, nickel and cobalt, and also hot brine deposits in the Red Sea, containing valuable gold, copper, zinc and silver. Some recent technical advances that may unlock the large economic potential of these minerals are described.]

In discussing ocean mining with any group of mining people, invariably the question is asked, "Can you tell us of any company making money mining hard minerals in the ocean?" The answer is yes. One company is making a lot of money mining barite in an offshore operation in Alaska. A large number of groups make money mining sand and gravels from the North Sea and English Channel. A dozen or so dredges make money mining tin from offshore locations in Southeast Asia. Several groups around the world make money mining limestone in various forms from offshore locations. However, all of these operations are in shallow water and frequently sheltered waters. While offshore placer deposits have been explored for and found in a number of locations in Australia, Southeast Asia, South West Africa, Alaska, California and other places, many of these deposits, being located in rather rough water areas, are waiting for the development of some placer mining technique which can operate effectively in at least moderate seas.

Concerning the recovery of materials from the deep ocean floor, substantially greater progress seems to

Dr. Mero is President, Ocean Resources, Inc., La Jolla, California, a firm specializing in management of offshore exploration and mining projects.

have been made in the development of effective mining techniques. Between \$100 and \$150 million has been invested over the past few years in exploration and in the development of techniques to mine and process materials. While the deep ocean floor holds a number of potentially commercial mineral deposits, there appear to be only two types that hold immediate significance: the deep sea metalliferous nodules and the deep sea muds. The nodules appear to be rather widespread throughout all the oceans, but commercial deposits of this material appear to occur only in the Pacific Ocean. Metalliferous muds, thus far, have only been found in the central part of the Red Sea. It is possible, however, that other metalliferous mud deposits can be found in the great rift zones which extend for tens of thousands of miles throughout all major oceans of the world. No one has ever specifically explored for such deposits.

Like the nodule deposits, most of the other mineral deposits of the ocean floor have been found by accident. Single deposits of nodules may cover many thousands of square miles of the sea floor and contain hundreds of millions of tons of commercially minable material. In aggregate, the Pacific Ocean floor probably contains a minimum of ten billion tons of economically minable nodules. A maximum estimate of the amount of nodules available for mining in the Pacific Ocean would probably be in the neighborhood of two or three hundred billion tons.

Red Sea Metalliferous Deposits

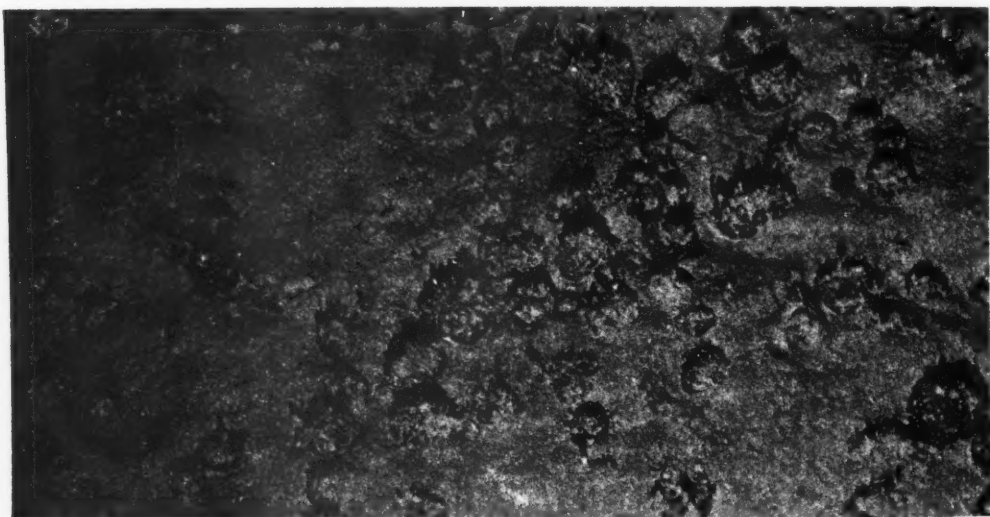
Since the opening of the Suez Canal in 1869 some 100 or more oceanographic research vessels traversed the Red Sea without realizing that they were passing within a few thousand feet of what is now recognized as one of the great potential ore deposits of the earth. During a routine hydrographic sampling operation in 1948, anomalous bottom water temperatures were noted by oceanographers, and several subsequent oceanographic expeditions confirmed this initial discovery of the hot brines at the bottom of the Red Sea. It was not until 1965, however, that scientists from the Oceanographic Institute at Woods Hole, Massachusetts, secured cores of the sediments underlying the pools of hot brine and discovered a major deposit of copper, zinc, silver, iron and other metals. This deposit was named the Atlantis-II Deep after the vessel from which the discovery was made. Average assays of metals in the sediments of the Atlantis-II Deep are: iron, 29 percent; zinc, 3.4 percent; copper, 1.3 percent; silver, 54 ppm; and gold, 0.5 ppm. The sediments contain from 55 to 96 percent of interstitial brine, but average about 85 percent. The value of the metals, not including iron, in this deposit has been calculated to be about \$2.5 billion. Although the composition of the sediments is not known below the ten-meter depth, seismic probe records indicate a total sediment thickness of possibly 25 meters.

Political problems in this area of the world appear to be more complex than any of the technical problems. The political control of the deposits, while apparently vested with the Sudanese government, has never been tested in court. The United Nations has disclaimed any control or ownership of the deposits. While Saudi Arabia has made some pronouncement concerning their ownership of these deposits, they have not interfered with the Sudanese government's granting an exclusive exploration concession to a Sudanese company which is controlled by the International Geomarine Corporation of Los Angeles. This company in conjunction with Preussag of Germany is presently conducting a substantial development program designed to establish the structure, grade and total size of this deposit and to determine the economics of mining and processing the sediment in it.

Deep Sea Nodules

The most spectacular of the oceanic mineral deposits, because of their vast extent, challenge in mining, and potential for restructuring the mining industry of the world, are the manganese nodules. While deposits of the nodules can be found within a few miles of land and in relatively shallow water, only in depths of water exceeding about 10,000 feet have deposits of substantial extent and high grade been found. Containing as much as 2.5 percent copper, 2.0 percent nickel, 0.2 percent cobalt, 36 percent manganese, as well as minor quantities of molybdenum, lead, zinc, etc., in a single deposit, or 57 percent manganese or 2.7 percent cobalt in other individual deposits, the sea floor nodules promise to be a major source of such metals as copper, nickel, cobalt and manganese for the world within the next 20 years.

BELOW: Manganese nodules on the ocean floor. [Photo: American Mining Congress Journal]



Manganese nodule deposits were originally discovered by scientists on the British Challenger Expedition in 1873. Few assays for the more valuable elements such as copper, nickel or cobalt were run on samples of the nodules in those early days and no consideration was given to these deposits as possible ores until a study was made by the Institute of Marine Resources of the University of California in 1958. The results of that study were favorable as to the technical and economic factors involved in mining and processing the nodules. The Hughes Tool, Kennecott Copper and Tenneco companies now have major programs for the exploration for ocean floor nodule deposits. In general, all groups that have explored them are satisfied that the deposits are there in vast quantities and sufficient grades to make the mining of them worthwhile. Process experimentation on the nodules by groups in Europe, the United States and Japan has indicated that the nodules can be reduced to salable products by several standard techniques.

Widespread existence of the sea floor nodules is now well established and accepted by informed persons as sufficient to support major mining operations. The processing of the nodules to finished products presents no great problems overall; however, development of a specific system presents the same problems that a company would experience with any new mineral deposit. The chemistry of the process must be developed and the chemical and physical aspects of the process piloted on a scale sufficient to allow scale-up without undue uncertainties. Transport of the nodules from a mining vessel to a port presents no great problems. Bringing the nodules up from the ocean floor, however, has been the major stumbling block to their development as a major source of metals. While feasibility studies have been made by a number of companies over the past ten years, only in the past two years has any real attempt been made to develop a rational mining technique. Recently the development by the Japanese of a continuous line bucket (CLB) method of dredging appears to have removed this block to the development of a deep ocean mining system. The development and testing of this system on a full-scale basis should not take more than a year.

A great advantage of the CLB system of mining nodules is that it will make it possible to initiate exploitation of the ocean floor nodules on a small scale. Because of the relatively small capital investment in the mining system, it will be economically practical to initiate a deep sea mining venture for a total capital investment of less than \$5 million. This investment would include a process facility to handle at least 200,000 tons of the nodules per year. Still, the operation would produce substantial revenues as at least \$60 to \$100 worth of products can be produced from a ton of the nodules, depending on the grade being mined. If the 200,000 ton per year operation is economically successful, it can be easily and rapidly scaled up to several million tons of nodules per year or more.

Company Activity Not Publicized

The natural resources industry has always been and will continue to be reticent about releasing information concerning activities in the exploration for and development of mineral deposits. While there is substantial interest and activity in ocean mining among natural resources companies of the world, most of what these companies are doing is not publicized and may never be publicized unless exclusive rights can be obtained to a property to be mined. In the deep ocean, there exists no legal regime to grant exclusive property rights. In any case, the deposits are so vast that under any circumstances short of one company's securing mining rights to the whole of the ocean floor, any group that wishes to do so and has the financial resources can enter the field. Thus, there is an added reason for the companies which may be developing these deep sea deposits or techniques to mine them to withhold the information from the public.

It will be the degree of efficiency by which these deposits can be mined, processed and the products marketed which will determine the profitability of a deep sea venture. Companies which develop a mining or processing system will naturally attempt to keep other competitors from understanding their approach to these problems or even from knowing that they might be interested in the deep ocean nodules. Only companies which plan to sell services or equipment will release much information concerning their activities in this field. It can be predicted, however, that as soon as one company is producing metals from the nodules of the deep sea, most of the major mining companies will be forced to follow suit.

[Excerpted from "Recent Concepts in Undersea Mining," Mining Congress Journal. Washington, D.C.: American Mining Congress, Vol. 58, No. 5, May 1972, pp. 43-46 and 54.]

The Politics of the Ocean

Charles Maechling, Jr.

[The present and potential wealth of the ocean has led many coastal states to make unilateral assertions of control over increasingly large ocean surface and seabed areas. The United States has proposed international recognition of a 12-mile limit on territorial seas, and the establishment of an adjacent international trusteeship zone for mineral exploration. Proceeds from explorations in this area would be distributed among the international community.]

Within the past five years the oceans have gripped the attention of a large part of the world community. An expanding deep sea technology has invested the oceans with fresh strategic and economic significance, extending downward to the hitherto inaccessible reaches of the ocean floor. Instead of being viewed mainly as a highway for war and commerce, the oceans are now referred to as nature's last frontier. These new perspectives have set in motion a train of events that have cast many settled principles of international law and custom into a limbo of uncertainty. Politico-legal norms that were once the exclusive concern of a few maritime and coastal powers are now undergoing clamorous challenge by the countries of Asia, Africa, and Latin America. Since World War II the prospect of new riches from the seabed, and the fear that others might appropriate them first, has led to a succession of unilateral encroachments over the free spaces of the ocean without precedent in international law. Four conventions approved by the first Law of the Sea Conference in

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1958 having failed to resolve the principal issues, the UN General Assembly has issued a call for a new Law of the Sea Conference to be held in 1973.

Extensions of National Jurisdiction

Until World War II the juridical status of the oceans and seabed had remained comparatively stable for 300 years. The freedom of the seas beyond territorial waters was universally accepted, subject of course to the exigencies of warfare. Most coastal states adhered to a three-mile limit for their territorial waters, thereby leaving free passage in international seas through all but a few straits and archipelagoes. The coastal seabed had no economic significance except for oystermen and crabbers, and national jurisdiction over the seabed was thought to coincide with jurisdiction over the superjacent waters.

After the outbreak of World War II, however, the Organization of American States at United States prompting passed the Declaration of Havana, which asserted a 300-mile protective zone around the Western Hemisphere in which belligerent activity was prohibited. The Declaration was without precedent in international law and was ignored by all parties. In 1941, while the United States was still neutral, President Roosevelt in a proclamation aimed at German submarine activity first declared the whole western Atlantic a "security zone," and later extended the zone to a line stretching from Iceland to the hump of Brazil. Both were unilateral assertions of sovereignty, albeit for a limited purpose. More serious in its consequences was the Truman Proclamation. In September, 1945, President Truman issued a proclamation asserting jurisdiction over the natural resources of the U.S. continental shelf, which an accompanying press release defined as an area contiguous to the coast, extending to a depth of 600 feet. The Proclamation was implemented by enactment of the Outer Continental Shelf Lands Act of 1953, which picked up exclusive jurisdiction for the federal government where the offshore jurisdiction of the states under the Submerged Lands Act left off and carried it seaward to an undefined limit. The Act also set up a system for federal leasing of mineral rights in the vast new area. Neither before the Truman Proclamation nor before enactment of the Outer Continental Shelf Lands Act was there any prior consultation with other governments.

The 1952 Declaration of Santiago, in which Peru, Ecuador, and Chile proclaimed exclusive jurisdiction over ocean and seabed to a distance of 200 miles from the coast, was the direct and avowed consequence of the Truman Proclamation. Shortly thereafter occurred the first seizures of foreign whalers and tuna boats. Various countries extended their territorial waters first to six and then to

12 miles. A few began to assert exclusive fishing rights well beyond these limits.

A general feeling of uncertainty over maritime rights, together with the threat that limits of six and 12 miles posed to free passage through international straits and archipelagoes, led to a Law of the Sea Conference at Geneva in 1958. From this Conference emerged four international agreements—the Convention on the High Seas; the Convention on the Continental Shelf; the Convention on the Territorial Sea and Contiguous Zone; and the Convention on Fishing and Conservation of Living Resources. These four conventions codified large areas of existing international law and formulated the concept of a 12-mile contiguous zone in which the coastal state had certain preferential rights. Nevertheless, the main consequences of the conference flowed from its two failures. By one vote the conferees failed to reach agreement on a six-mile territorial sea, thereby leaving the way open for another wave of unilateral extensions of coastal state sovereignty over the surface. And while the Convention on the Continental Shelf sanctified the principle that a coastal state has jurisdiction over the natural resources of the adjacent submerged land mass, it failed to set a fixed boundary to that jurisdiction. The Convention set the seaward limits of national jurisdiction at 200 meters "or beyond that limit to where the depth of superjacent waters admits of the exploitation of the said areas." By the time the Continental Shelf Convention went into effect in 1964, the rapid advance of deep-sea drilling technology was already in process of making this definition openended. No one could now say what the ultimate boundary of the legal continental shelf would be, except that it would march seaward as the technology progressed.

As these trends became clearer, the positions of the various parts of the world community began to crystallize. A large bloc of less developed countries, including the land-locked, became convinced that only a strong international regime to administer the exploitation of resources in the rest of the seabed and parcel out the proceeds among the world community could preserve the common heritage. Many of these countries also espoused the concept of a narrow continental shelf, which would leave greater reserves for the world community.

In the meanwhile, however, the freedom of the superjacent waters deteriorated. Early in 1967, Egypt closed the Straits of Aqaba, thereby precipitating the Six-Day War. Six more Latin American countries joined the 200 milers, and India, Pakistan, Ceylon, and Ghana claimed 100-mile exclusive fishing zones. More American fishing boats were confiscated on the high seas. The island nations of Indonesia and the Philippines enclosed their archipelagoes within territorial waters. Canada enacted the Arctic Waters Pollution Prevention Act of 1970, unilaterally asserting the right to establish anti-

pollution standards in international waters north of the 60° parallel. Throughout Latin America and Africa, prohibitory red-tape and consent requirements were being placed in the way of foreign oceanographic research over continental shelves in what had been international waters. By 1971 only 26 countries (including the United States) still adhered to the three-mile limit; nearly 50 countries had shifted to 12 miles. Everywhere in the world the free spaces of the ocean appeared to be shrinking.

U.S. Proposal

In the face of these developments the posture of the United States government with respect to the seabed reflected deep-seated internal divisions. From a military standpoint, the strategic importance of missile-firing submarines and of submarine detection devices had made maximum access to the ocean and seabed a military imperative and led the Defense Department to come down firmly on the side of a narrow legal continental shelf. The oil industry and the resource-oriented Departments of Interior and Commerce took the opposite stance. Contending that the mineral resources of the U.S. continental margin, including an estimated 780 billion barrels of oil reserves lying between 200 and 2,500 meters, was too priceless a national asset to be handed over to an international regime, they argued for a seaward boundary of national jurisdiction coterminous with the edge of the continental margin. They also stressed the uncertainties that would afflict private investment if forced to deal with an international regime, and predicted dire consequences for the balance of payments if the country fell into further reliance on foreign oil imports.

After considerable internal debate, the position of the United States on these interrelated issues was resolved in a lengthy statement on ocean policy delivered by President Nixon on May 23, 1970. In August, 1970, this was supplemented by a more specific United States proposal in the form of a draft convention for the international seabed area which was tabled as a "working paper" at the Geneva meeting of the UN Seabed Committee. Their proposal called for renunciation by all nations of claims to seabed resources beyond the depth of 200 meters; prescribed these resources to be the "common heritage" of mankind; and called for an international trusteeship zone for mineral exploitation from the 200-meter depth to the edge of the continental margin in which exploration and exploitation of resources would be under the effective regulatory control of the coastal state as "trustees for the international community." It made provision for allocation of substantial mineral royalties from the trusteeship zone to an economic assistance fund for the less developed countries. Beyond the continental margin, all mineral exploration and exploitation was to be put under the control of a new in-

ternational seabed authority. But in the interim coastal-state leasing would continue.

In a parallel move, the United States for the first time accepted the 12-mile territorial sea as the only compromise realistically attainable, but subject to the essential condition that there be free passage through straits that would otherwise cease to be international waters. It also accepted the concept of preferential fishing rights for coastal states beyond the 12-mile territorial sea. Taken collectively, these provisions represented an attempt to terminate blanket assertions of national jurisdiction over the high seas and seabed; to stabilize the limits of territorial waters and seabed at 12 miles and 200 meters, respectively; and at the same time to satisfy the concerns of the less developed countries by awarding them a monetary share in any proceeds from mineral exploitation seaward of 200 meters.

The first two preparatory meetings for the 1973 UN Conference, held in Geneva in the spring and summer of 1971, revealed opposition to various elements in the United States proposal. Canada, Australia, Norway, and Spain asserted the right of the coastal state to protect its shores from pollution and other threats emanating from the high seas. The Spanish delegate stated that free passage of supertankers, nuclear vessels, and ships carrying "dangerous cargo" through Spanish coastal waters and the Strait of Gibraltar was no longer compatible with Spain's national security—which carried to its logical conclusion would exclude the Sixth Fleet from the Mediterranean. Peru, Chile, and other Latin American states not only clung to their 200-mile claims, but characterized the United States seabed proposal as a transparent attempt to place coastal states in a state of dependence on foreign capital and technology. The 200-mile position was given intellectual respectability in the form of a moderate variant advanced by Ambassador Pardo of Malta, applicable both to the seabed and superjacent waters, which would safeguard all innocent passage and accord limited freedom to scientific research. More importantly, an influential group of Asian, African, and Caribbean countries, including India, came out for an international regime with much greater control over the seabed and its resources beyond 200 meters than under the regulatory machinery proposed by the United States, even to the extent of having the regime conduct exploration and exploitation on its own account. The notion that a share in revenues alone would satisfy the aspiration of the less developed countries was shown to be illusory. Many of the Afro-Asian countries also rejected the trusteeship concept.

Need for a Strong International Regime

If allowed to continue unchecked, present trends clearly point toward an unbridled scramble for ocean space and a gradual disappear-

ance of the high seas. In the resultant anarchy, exploitation of fisheries and mineral resources will certainly continue, but in an atmosphere so charged with controversy, recrimination, and legal uncertainty that prospects for mutual cooperation in preserving the marine environment and in conducting unhampered scientific research—both essential to resource development—will diminish to the vanishing point. The inevitable consequence will be accentuation of the gap between the developed countries and the less developed, the rich and the poor.

The oceans and seabed constitute one indivisible entity upon which the entire world is dependent; and this entity cannot be preserved, let alone be exploited, in the absence of a strong international regime to regulate every aspect of its use. Only an international regime that will actually govern ocean space and take title to its mineral resources—not merely act as a claims registry and royalty depository—can check the current trend toward creeping extension of coastal state jurisdiction over the hitherto free spaces of the ocean and seabed. The regime must be based on the narrowest territorial sea and continental shelf limits attainable, for unless the regime has exploitation rights in areas where marine resources can be economically recovered it will have nothing to offer the world community in the way of tangible benefits. The regime should be endowed with strict authority to set and enforce anti-pollution standards and should also be empowered to develop extensive scientific research programs on its own account. There should be a guarantee of absolute non-interference with national scientific research programs conducted with the intent of open publication throughout the international ocean and seabed area. Finally, the international ocean and seabed area should be neutralized and reserved for peaceful purposes, according to the pattern successfully developed for Antarctica. Only then will there be some hope for ending the present anarchy and bringing the common-heritage concept to fulfillment.

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A Law of the Sea Conference: Who Needs It?

Robert L. Friedheim

[The world community is relying solely upon a single, indefinite, universal law-making conference to resolve the multiple problems of the increased uses of the sea. Should the conference not take place or should it fail, we may experience anarchy on the sea. Alternative supplementary approaches should be explored.]

We are at the United Nations for the third time on law of the sea matters. If we are to give ourselves the maximum chance for concluding a UN Law of the Sea Conference successfully, we must understand the political nature of the UN system. We must not forget that the UN General Assembly is a political forum in which states and groups of states attempt to foster and protect what they see as their interests. We may be attempting to create law at the UN Law of the Sea Conference, but the problems that arise are more a result of clashing national wills on policy than of contrasting legal philosophies. We must recognize that at the heart of the debate on the law of the sea is the question of allocation—allocation of the ocean's areas and permissible uses between contending parties that consider notions of "jurisdiction," "control," or "freedom" not as theoretical abstractions, but as concepts that enhance their short-run interests or provide them some tactical maneuver room.

A second factor in assessing the UN as a negotiating forum is a recognition of how its General Assembly, or General Assembly-sponsored conference, is

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skewed in favor of the developing countries. There is now a permanent majority of states from the Third World in the General Assembly. At least three further observations can be drawn from this fact. First, the issues that will be seriously negotiated at the United Nations are those that are salient to the majority. Second, we in the developed countries will always be under the threat of the exercise of majoritarianism. Third, we cannot expect a majority to be interested in developing rules for the ocean divorced from extra-oceanic considerations.

If it is necessary to have issues on any UN agenda salient to the developing majority, it is necessary that we consider the question of whether the law of the sea per se is salient to the majority. The answer is that the law of the sea as we know it is only indirectly relevant to the developing states. It is the ocean users—the developed—who claim an imperative need for known rules of transiting on, over, and under the ocean, who need laws to state with precision what the rules of the game are in ocean exploitation, who are concerned with ocean science both as a source of useful information and as a source of scientific truth, and who, because they are both the major offenders and major potential victims, wish to bring man's degradation of his environment under control.

While some developing states have substantial ocean interests (the West Coast Latin Americans in fishing, some African and Middle Eastern states in offshore oil), most are primarily concerned with the problems arising out of their own underdevelopment. Thus there are two foci to the ocean concerns of the developing states. The first is the hope that they might harness the resources of the oceans to overcome their grave disadvantages. The second is the knowledge that they can prevent the developed from using the oceans to widen the gap between developed and developing.

The idea of extracting revenue is still alive, and the hope of many developing states to create ocean exploration and exploitation capabilities is becoming one of the major themes of the debate. Such aspirations ought to be viewed sympathetically by the developed, not only because it is the "right" thing to do but because unless the developing find some salient issues in the debate over the uses of the sea, they will anticipate no profit from the conference decisions. Thus, they will have no incentive to be cooperative.

Unfortunately another focus of some of the developing states cannot be viewed so benevolently by the developed: that is, the possibility of blocking or slowing down the access of the developed to ocean uses and resources. It is understandable that such a course would be tempting to the developing; but such action would reduce ocean problems to a mere surrogate for the main issues of the developed-

developing conflict. This is not to say that there is no reality to developing country fears that, left unchecked, the developed will use access to ocean areas and resources to benefit only themselves, and will thereby widen the discrepancies between the two sets of states. But to handle the problem in this manner is clearly not productive for any country.

The temptation must be strong for the developing countries with the voting majority to try to break the deadlocked issues in UN negotiations by insisting upon their own way. Thus far the developing countries have not pursued this course as frequently as had been predicted. But we must understand that the threat will be constantly present when the issues under negotiation are important to both groups.

Symbolic issues. Another characteristic of UN politics relates to the type of issues which, if consensus is not achieved, are likely to be forced to a vote. Many of the most contentious issues which could be brought to a vote in the Law of the Sea Conference are highly "visible" issues with a large symbolic content. Especially touchy are those issues which deal with aspects of territoriality. For example, if "freedom of ocean science," which in the minds of most developed-state audiences has a positive connotation, correlates very highly with control of territory in the minds of representatives of many developing states, we ought to be warned that such a concept will have a difficult time gaining a requisite majority if brought to a vote.

When issues are symbolic, there is a tendency for states to be rigid in their voting. And what is being debated at the Seabed Committee are exactly those concepts by which states define themselves. Despite statements by the developing that Western-derived international law is unjust, they find some aspects of that law highly relevant to their present status and future aspirations. Many of the developing are comparatively new states, setting their borders not always without conflict, and concerned with national loyalties. Thus they find concepts of sovereignty and territoriality highly salient and will vote for the symbols which help to reinforce their new independence. And so they must, for no regime would survive long if it voted contrary to national feelings. On occasion, American diplomats are reminded that the United States is not the only state which must respond to public opinion. In summary, we are not going to get sensible solutions to ocean problems if we force symbolic issues to a vote. Such advice would be a prescription for disaster.

Universalism. Negotiating ocean use problems at the United Nations also tends to universalize problems, many of which might better be handled at a bilateral or regional level. For many ocean

use problems are area-specific, or, if biological, stock-specific. For example, environmental degradation is a general problem but turns out to be more severe where there is an enclosed or semi-enclosed sea rather than an open ocean. The measures needed to deal adequately with the problem will very likely differ from region to region. Unfortunately many of these regional or local needs are swept aside in the search for a formula that a great variety of states could support.

Many ocean use problems are area-specific in another sense—they are political regional problems. Much of the turmoil in the contemporary law of the sea is a result of the Latin American 200-mile claims. They have made no secret of the fact that their quarrel is with the United States. That is, it is a regional or hemispheric problem which we might have settled years ago by recognizing that these were essentially resource and not territorial claims. Bringing the problem to the UN has had the effect of transforming a regional into a universal problem. It has forced the Latin Americans to lobby vigorously for their position among the developing in general. It has made them try to sell the 200-mile zone as the only possible salvation of the developing states vis-à-vis the rapacious developed. If they succeed in selling this position to the developing we will have a serious problem indeed. This will not be merely a voting problem; it will be a problem of conflict in the real world.

Trade-offs. Observers of UN politics are aware that not all of the trade-offs and deals are made on the particular items on an agenda. But too often Western delegations to special UN-sponsored conferences have prepared for the issues on the agenda of that conference and little else. Indeed, they are usually authorized to bargain only on the items on the formal agenda. In other words they may consider trading an orange for an orange rather than an orange for an apple. This appears to have been the case in the instructions of the U.S. delegation to the UN Conference on the Human Environment.

If the same pattern prevails in the instructions of the U.S. delegation to the Law of the Sea Conference, it would be a pity, because it does not reflect the necessities of the bargaining environment. The developing states are not primarily interested in developing a set of rules for ocean use per se. What they want is an apple for an orange—a concession on development assistance, more attention on the part of the U.S. to the plans of UNCTAD (the United Nations Conference on Trade and Development), or lower developed-country tariffs on developing-country products. Until the developed understand that they must make concessions on subjects unrelated, or only peripherally related, to the law of the sea in return for developing country concessions on the law of the sea, we can expect little progress.

Alternative approaches. I believe that, if viewed in perspective, lack of substantive progress at the last several law of the sea negotiating sessions may not necessarily point toward a disaster in the law of the sea. The stalemate gives all participants with important interests at stake time to back away from the extreme positions that they have so bravely announced on the floor of the Assembly or Committee. Many states—of greatly varying persuasions—doubtless would be grateful not to have to push their symbols to a vote.

The time we will gain by not trying to push a law of the sea conference to the voting stage in 1973 will also provide us time for a number of other important tasks. First among them is the task of seeking solutions to ocean use problems by means other than a universal UN-sponsored law-making conference. I mean this in two ways depending upon the circumstances. The first is a rival medium for solving ocean use problems; the second is a supplement to the UN proceedings.

I suspect that the developed countries have never really considered an alternative to UN bargaining on a transnational, regional, or interested parties basis. The developing have not neglected such specialized conferences, with the Latin Americans meeting on law of the sea matters at Lima, Peru, and Montevideo, Uruguay; the Asian-African Legal Consultative Committee meeting at Colombo, Ceylon; and the heads of non-aligned countries meeting at Lusaka, Zambia. If the Law of the Sea Conference does not convene, or fails, many of the developing will try to enforce as law the positions they decided on at such meetings.

The developed should do no less, if only to demonstrate what would occur if there is no effort to reach compromise at the Law of the Sea Conference. Given the technical resources available to the developed countries, specialized conferences can take the lead in drawing up draft conventions which could then be presented either as documents the participating states alone would agree to, or as the basis for further bargaining between the participating and non-participating states.

The second reason to look to regional, user, or specialized conference means of coping with new ocean use problems is that, even if the Law of the Sea Conference succeeds beyond our expectations, it cannot deal with all the relevant problems. It cannot, first, because of the sheer complexity of the issues, and second, because some problems are a result of local or regional physical or biological anomalies which should be dealt with on a less-than-universal level. Many inter-governmental organizations have interests in the oceans and have made important contributions to their better use. They should be more frequently used, improved, and strengthened.

Moreover, there is a warren of transnational non-governmental organizations interested in the oceans, whose services have been and can continue to be called upon to solve ocean problems. Too often we neglect that which is not dramatic or instantaneous.

We will also make wise use of the time provided by the stalemate if we spend some of it reexamining the fundamental issues of ocean use. As ocean uses increase, the old conceptual framework of freedom of the seas will become increasingly inadequate. It is no longer sufficient to assume that any ocean user can do as he pleases as long as he does not interfere with the rights of others, because we know how interrelated are the activities on the oceans and how comparatively fragile the ocean is. We can congest straits, we can pollute offshore waters, and we can overharvest fish stocks.

In short we must deal with the problems arising out of the common property nature of the ocean. We cannot merely assume that the answer is to extend national jurisdiction out to some mid-ocean median point where one state's "territory" will meet that of another state whose land territory begins on the other side of the ocean. Some aspects of "freedom of the seas" are still relevant to the rational use of the oceans. Somehow we must balance off the restrictions necessitated by greater use with the freedoms that would allow us to use the oceans without excessive costs and administrative burdens. We are still awaiting a new operational concept for characterizing the permissible ocean uses of the future.

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Land-Locked States and the Law of the Seas

Patrick Childs

[The land-locked nations' primary concern in 1973 will be the implementation of an international regime that will adequately represent their special interests. Since it is commonly accepted that those waters outside national territorial jurisdiction are reserved for the benefit of mankind, the real question will revolve around the quantity of representation and not the fact of representation itself.]

Approximately one-fifth of the nations of the world are land-locked, having no direct access to the sea within the bounds of their territorial jurisdiction. In recent years these nations have sought to secure for themselves various rights that the coastal nations have due to geographical location. The traditional demand of the inland countries has been that of unrestrained access to the sea; but now, with the significant strides that oceanic sciences have made in the last two decades, their demands have spread into other areas. It is becoming apparent that the resources of the sea are going to play an ever-increasing part in the economic picture of the world. In addition to animal and plant products, the sea will now be expected to supply a growing population with a variety of mineral resources as well. Although the feasibility of extracting specific minerals may be in doubt for the present, there seems to be little contention that in the near future mineral extraction will proceed, and the harvests will be quite substantial.

The land-locked states have a great interest in the results of any massive harvest of ocean resources. Many of their interests are shared with coastal states;

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some are unique. While all mineral-exporting nations may suffer from a slump in international prices, the inland countries carry an added burden of overland transportation costs. While most coastal nations could expect some return from the min-

The land-locked countries include: Botswana, Burundi, Central African Republic, Chad, Lesotho, Malawi, Mali, Niger, Rhodesia, Rwanda, Swaziland, Uganda, Upper Volta and Zambia; Afghanistan, Bhutan, Laos, Mongolia, Nepal; Austria, Czechoslovakia, Hungary, Liechtenstein, Luxembourg, San Marino, and Switzerland; Bolivia and Paraguay.

erals of their shores, the inland countries would receive nothing. Because land-locked states suffer the same population problems that others do, a new interest in the sea as a source of protein has developed. Indeed, many land-locked nations have developed extensive markets within their borders for fish and fish products. This has fostered a desire by these countries to see that proper conservation techniques are adhered to so that their source is preserved and the product price remains minimal.

Access Rights to Ocean Ports

Perhaps the most evident disadvantage the inland countries suffer is the absence of a seaport. The sea offers an avenue for trade development with the rest of the world that cannot be matched by overland routes. Not only does the sea offer the cheapest mode of transportation, but in many instances it offers the only way in which international markets can be reached. Two land-locked states, Switzerland and Paraguay, can be reached via rivers which can accommodate ocean vessels, but they are the exceptions.

Legal justification for the right of access has traditionally been based on such concepts as natural law and the freedom of the high seas, but legal philosophies have had little effect on those coastal nations that would have to grant the rights sought. The problem has been dealt with in bilateral treaties, in the negotiation of which the land-locked states have distinct disadvantages. The price the land-locked nations would have to pay to secure such transit treaties was high when compared to the minor cost suffered by the coastal nations. No matter how strong the wording of the treaties, the land-locked states' trade would remain dependent to some extent upon the current policies of the coastal states.

It is no surprise that inland countries have sought to secure broader and stronger rights in this respect than could be offered by a bilateral treaty. International agreements which have provided for rights of access in principle, with varying degrees of specificity, are: the Convention on the Freedom of Transit (1921); the General Agreement on Tariffs and Trade (GATT - 1947; over 80 signatories); the Convention on the High Seas (1958; 49 signatories); and the Con-

vention on Transit Trade of Land-Locked Countries (1968; 24 signatories as of January 1972). But these agreements have not satisfied all the needs of the inland states, and a more effective and comprehensive type of arrangement is now being sought.

The question remains as to what leverage these inland states can exercise, in order that their interests be embodied in an international agreement. The inland states, as a group, control approximately 20 percent of the votes in the General Assembly. This is quite a substantial number, but considering the nature of the inland states' demands, resistance must be expected. As a practical matter, the majority of these nations have little economic leverage through which they could force concessions from allied or neighboring coastal states. Most of them—other than the European countries like Austria, Czechoslovakia, etc.—are among the poorest and least developed nations of the world. In addition, the land-locked countries of Africa, Asia, and South America tend to be economically dependent upon their richer coastal neighbors. Thus Uganda is dependent on Kenya; Swaziland on South Africa; Mongolia on Russia; and so on. Obviously, this economic dependence tends to minimize the pressure that the land-locked states can exert to further their oceanic interests. It is the very dependence from which these countries seek to escape that binds them to a less militant stance.

There are also political considerations. While many inland countries may desire rights associated with the sea, it cannot be expected that they will foresake allies or overbearing political powers. For example, it can be expected that if Russia actively seeks to prevent the formulation of an international regime, Czechoslovakia, Hungary and Mongolia will do the same. This consideration might apply to a lesser extent to those inland states which seek to preserve their strict neutrality in international affairs, so that such countries as Switzerland and Austria, while sympathizing with their fellow inland states, might not exert the degree of influence that they otherwise could. There exists no military might of any consequence among the land-locked nations, and accordingly the coastal states presently feel no threat of hostile action. Of course, this may not always be so: for example, Rhodesia could possibly turn into a menace to a neighboring state. However, since the possibility of military action to secure access to the sea seems remote, and there are no immediate fears, it is unlikely that this will play any part in the considerations of coastal nations. All of the above factors tend to fragment the potential influence of a unified block of inland nations. It remains to be seen whether these considerations will, in fact, prevent meaningful gains for these countries.

Non-Living Ocean Resources

Oceanic resources will undoubtedly influence international politics in the future. The resources are both plentiful and in some instances already relatively cheap to extract. Presently, with the exception of hydrocarbons, the exploitation of the seabed resources is carried on at a very minor pace when compared with dry land exploitation. While such resources as phosphorous compounds, manganese, titanium, zircon, diamonds, iron, gold, tin, sulfur, salt, bromine, sand, gravel and hydrocarbons are being taken from the ocean bed, the total value of all of these extracts per year is not as high as the value of the sea's protein products. By far the most important products in value are the hydrocarbon resources, and with new petroleum discoveries there is every reason to believe that the significance of seabed extraction will increase tremendously within the next few years. Of the other minerals, nickel, copper, cobalt, zinc and manganese can be forecast as among the first to be exploited in the future.

The inland countries no doubt feel that they have a direct stake in the harvesting of these materials. Indeed, they have often expressed a desire to participate, not only because of the economic impact these resources may have on the world market, but also because it is possible that they, especially the underdeveloped nations, could utilize the exploitation of these resources as a source of income. Regardless of the time in which the production of any of these minerals achieves a level that could produce significant effects on the international markets, it is mandatory that the land-locked nations act now in securing their rights. The fact that our technology in marine resource development exists at such a state that production is feasible suggests that belated attempts to secure oceanic resource rights could result in failure; countries which have invested large sums of money in the development of sea resources will not easily let go of the proceeds received. If the inland countries are to finalize the interests which they feel are due to them, they must do so at the 1973 United Nations Conference on Law of the Sea.

Economic Impact of Seabed Minerals

The United Nations has expressed the intent that the sea not only be used for peaceful purposes, but also that the development of marine resources be undertaken with all countries taking part. However, no consensus exists as to what the actual impact of these resources will be. This information is especially important to the mineral-exporting land-locked states. Bolivia and Czechoslovakia had this in mind when they urged the General Assembly of the United Nations in 1971 to take special measures so that all land-locked nations would be protected from adverse economic reactions.

Early estimates of the return that could be expected from marine resource exploitation often approached magnificent sums. This unbridled enthusiasm has been somewhat cooled by the recognition of economic realities. However, many of the more developed countries are giving the exploitation potential of the ocean floor serious consideration. Where governments have been slow to act, private companies have taken the initiative. For example, the Hughes Tool Company has announced that construction is already under way on a 324-foot barge and a 565-foot mining vessel to be used in the harvesting of manganese nodules. The vessels are designed to be operational at depths from 12,000 feet to approximately 18,000 feet under the surface of the ocean. This means the vessel has mining capabilities that extend well into international waters. (Note that as recently as 1966 the United States' undersea mining operations were conducted at depths of less than 1,000 feet.) Aside from hydrocarbons, manganese nodules have evoked the most fascination from potential investors. It has been calculated that one ship could mine as many as 4,000 tons of nodules in a day if it were operating within a rich field of the nodules. The nodules, which rest upon the sea floor, can congregate in amounts as large as two pounds per square foot. They contain several other minerals, in varying concentrations, along with the high content of manganese. Furthermore, there is some evidence to support the contention that these nodules are being manufactured on the ocean floor at a faster rate than we are using the materials on a yearly basis, although this natural manufacturing of the nodules could not replace the present concentrations that we can expect to find.

A few predictions of what the economic effects would be if mass exploitation were undertaken have been attempted. At present levels of consumption and with the full utilization of present technology behind a mining effort, it has been calculated that on the world market manganese would drop as much as 50 percent in price. Cobalt prices could be reduced as much as 30 percent, and nickel about 5 percent; zinc, copper and lead could also drop in price. These calculations may be inaccurate and misleading; but if world prices did fall in accordance with these estimations, the consequences could be drastic to many inland states. Uganda could expect adverse effects on the sale of its nickel and copper. Bolivia's lead, cobalt, copper and zinc exports might be subject to the same fate. A number of inland countries could face such a situation.

Land-locked states face a totally different problem when hydrocarbons are considered. Controls there would be sought, not so that prices be kept up, but rather so that prices be kept down. Only one of the inland states, Bolivia, is a petroleum producer of any consequence. For this reason it is probably in the interests of most inland states to try to ensure either a continuing source of pe-

troleum at a low price, or international controls through which they can profit—that is, some sort of income from those resources outside of national jurisdictions.

The development of oceanic hydrocarbons will probably be the hardest problem to bring under international control. Not only is the potential market extensive, but nationalism will undoubtedly play a very important part in any international debate on the subject. Massive oil discoveries beyond the continental shelf, yet clearly within a nation's interests, will serve to complicate the matter further. The recent discovery off Nova Scotia, estimated to extend all the way from Sable Island to the Carolinas in the United States, is a case in point. It seems very unlikely that the United States and Canada will allow foreign exploitation of any kind upon these resources. The majority of inland nations have interests here that diverge from many of the other underdeveloped states. Some of the underdeveloped states are petroleum producers and seek to maintain their income sources. The interest of these countries is to see that the ocean resources are developed at the slowest pace. Industrial countries, however, would seek rapid development. Accommodation through international agreements must take cognizance of all the diversity in national interests involved.

Some Proposals for International Controls

If an international regime of the seas is to be a governing body with actual authority, it is obvious that this authority must be based upon power vested by the various nations. Of the nations that make up the United Nations General Assembly, by far the majority are underdeveloped, and therefore lack the capability to exploit the seas to any large degree. The initial investment in a full-scale oceanic development program will undoubtedly involve large quantities of money and technological accomplishments beyond the abilities of any small or underdeveloped nation. Foreseeably, the results of unchecked mass exploitation by the technically advanced countries would ensure the rich getting richer and the poor poorer. To remedy these inequities several novel solutions have been proposed.

The idea that has attracted the most attention would establish a system of administration whereby exploitation licenses would be issued for specific areas of the ocean floor. Income received from the issuance would then enter a fund, with distribution directed at those states which have the greatest economic need. To the inland mineral-exporting nations, such a method of administration has faults if stringent and practical controls are not adopted. Suffering losses in their markets for their earth resources, the incomes received would at most compensate for the losses. Extrapolated into the future, it could mean that many of their earth resources might never be de-

veloped at all. Meanwhile, their coastal neighbors would grow economically at a disproportionate rate due to the added incomes from exploitation of their marine and shelf resources.

A proposal by W. Frank Newton has some merit. He suggests dividing up the international areas of the ocean floor among all countries, allocating certain areas for developing countries and others for developed countries, thus allowing the lesser powers to have control over their own economic interests. The exploiters could only exploit the areas through national licenses. He further suggests that a system could be set up whereby a more developed nation would have proportionately fewer licenses to distribute than a less-developed nation. The number of licenses that a developed nation then could issue would go up in accordance with the numbers issued by the developing states. To an inland state, this would very likely be the best of all possible methods of marine resource distribution. They would have a share in the control over the development of the resources, and rather than continually be fighting the market impact of sea resources they would actually be sharing in the proceeds. But it is unlikely that the developed states would endorse this method of distribution.

Ambassador Pardo of Malta seems aware of the problems and conflicts that must be faced by the land-locked countries. He would give them, in his model, 20 percent of the total vote. This would approximate the voting power that these countries hold in the United Nations General Assembly, and therefore increase the likelihood of approval of an international regime. In Ambassador Pardo's scheme, the technologically developed nations would receive 40 percent of the votes, with the remaining 40 percent going to the coastal developing nations. Where conflict arose between any two groups, the interests of the inland states could be well served because an alliance with these states would involve a substantial number of votes.

The most comprehensive proposal to date appears to be the United States "Draft United Nations Convention on the International Seabed Area." The United States proposal develops international control around two governing bodies: the Assembly and the Council. The Assembly would be composed of all contracting parties to the Convention. It would authorize procedures to be followed by the regime and make recommendations as to policy. The Council would be the real source of authority in the United States proposal. Membership would be limited to 24 parties, of which six would be the most industrially advanced states. The remaining 18 seats would be filled by representatives from at least 12 developing states and two seats by representatives from land-locked or shelf-locked states. [Shelf-locked states are coastal states whose legal continental shelf is cut off from the seabed beyond national jurisdiction by the continental

shelf of another state; there are 23 such countries.] The United States proposal leaves open the possibility that the Council representation may have several land-locked countries (i.e., more than the minimum of two members who must be from land-locked or shelf-locked states). In this regard, the United States proposal may appear attractive to the inland countries.

The proposals mentioned are, in varying degrees, representative of all the international regime formulations that will be given serious consideration in 1973. It should be noted that the land-locked and shelf-locked countries have drawn up a proposal that would divide the authority of an international regime equally between themselves and the other states. This proposal deserves little consideration; it is obvious that the coastal states would reject such a reduction of their authority.

Whether the seabed is eventually controlled directly by a United Nations board or by a system of ocean floor allocation, the license fees or royalties cannot be so high as to dissuade investment. If fees are set at a rate inconsistent with profitable investment, it is apparent that the countries capable of marine resource exploitation will merely ignore any international covenants, leaving the inland and developing states with a white elephant. They will, instead, concentrate their technology on the development of resources within their territorial waters. With a few developed nations working towards the exploitation of their own minerals, independently of any international controls, the other countries will eventually lose not only their potential share in international revenues but also the technological training necessary for their marine resource development.

[Excerpted from "The Interests of Land-Locked States in Law of the Seas," San Diego Law Review. San Diego, Calif.: San Diego Law Review Association, University of San Diego School of Law, Vol. 9, No. 3, May 1972, pp. 701-704 and 716-728.]

MONETARY REFORM



A JOINT BANK/IMF MEETING
CONSIDERS FINANCIAL REFORM
AND DEVELOPMENT PROBLEMS.
[PHOTO: WORLD BANK]

The Need for Reform in the International Monetary System

Executive Directors of the
International Monetary Fund

[The following excerpts from the official statement by the Directors of the International Monetary Fund explain the* need for monetary reform and the interests of developing countries in this process. Explanatory statements were added within brackets.]

The thirty years since the establishment of the International Monetary Fund in 1944 have been characterized by a massive expansion in world trade and payments. However, it has become increasingly apparent that the operation of the world monetary system has been impeded in some cases by the mutual incompatibility of member countries' domestic and exchange rate policies, and also by the inability of the system to accommodate certain major changes in the international economic and financial environment. These weaknesses in the working of the adjustment process reflected the following problems:

(1) The difficulty of achieving timely and adequate changes in exchange rates became increasingly apparent in cases of both surplus and deficit countries, especially in the 1960s. It arose in acute form in the case of the U. S. dollar. Nothing in the Fund's Articles precluded a change in the par value of the U. S. dollar, and indeed the history of the negotiations preceding the realignment of December 1971 shows that the willingness of the United States in the end to undertake such a change was a positive factor in promoting the general readjustment of parities which was ultimately achieved. However, it was widely assumed, throughout the postwar period, that par value adjustment was as a practical matter unavailable to the United States. This assumption derived principally from the position of the United States as the largest

economy in the system and from the associated major importance of the United States in world trade and capital transactions. Other special factors were that the United States was the only major country which chose the option of freely buying and selling gold as a means of fulfilling its exchange stability obligations, and the predominant role of the U. S. dollar as a reserve currency to which other currencies were pegged. Inflexibility in the par value of the dollar did not matter in the immediate postwar years when the economic position of the United States was overwhelmingly strong, but it became increasingly troublesome in the 1960s as structural changes and developments in relative costs and prices led to a diminution in the competitive position of the United States.

(2) The rise in the volume of international transactions, and thus in the magnitude of the financing that might be needed for balance of payments disequilibria, made it necessary for the stock of international reserves to rise over time. With the monetary price of gold remaining unchanged, the supply of newly mined gold and the use of Fund facilities met only part of the need for reserves, and the bulk of global reserve creation took the form of increases in holdings of dollars. But though accrual of reserves in this form met a global reserve need and was thus a beneficial influence on economic activity and expansion, it could continue only as long as the United States incurred balance of payments deficits and surplus countries were willing to accept and retain a large proportion of dollars in the financing of their surpluses. It became increasingly apparent, however, that the system was not able to withstand the strains of a method of reserve creation that involved persistent balance of payments disequilibria. Dissatisfaction with reliance on this process led to the establishment in 1969 of the facility for Special Drawing Rights. [SDRs—a new form of international money created by the Fund and distributed to member countries in proportion to their Fund quotas; SDRs may be held as part of a nation's official monetary reserves or used for payments between governments.] The first decision to allocate SDRs was predicated on the assumption that the earlier process of reserve creation had substantially come to an end. However, the external deficits of the United States and the accumulation of dollars both rose to unprecedented size in 1970 and 1971 under the influence of exchange rate misalignment and massive capital outflows. Moreover, global reserve creation was accelerated further by the buildup of official balances in currencies other than the dollar.

(3) The difficulties of the system have been exacerbated by other factors. For example, countries have been affected in varying degrees by the emergence of cost-push inflation, and experience in curbing inflation by means of incomes and prices policies has been mixed. Increasingly complex problems have arisen in dealing with the external effects of the differences in cyclical phasing as between

countries. These difficulties have been compounded by the increased resort that many countries have had to monetary policy for the pursuit of domestic stabilization, as a result, in part, of the relative inflexibility of their fiscal policies. The consequential reduction in the ability and willingness of countries to attune their monetary policies to balance of payments objectives has made balance of payments adjustment more difficult.

(4) The substantial increase in imbalance attributable to capital flows was associated with an enhanced responsiveness of such flows to incentives of all kinds and to diminished confidence in the maintenance of fixed par values, as the needs for adjustment came increasingly to be recognized but needed adjustments were delayed. The marked deterioration in the U. S. basic balance coupled with capital flows of this kind from time to time greatly intensified pressure on the U. S. dollar and on the U. S. gold reserves. Intervention in the private gold market was withdrawn in March 1968. The convertibility of officially held dollar balances into gold or other reserve assets was suspended by the United States on August 15, 1971.

Aims for a New System

The need for reform has to be seen in the context of the broad aims of economic policy which, as stated in the articles of the Fund, include:

. . . the expansion and balanced growth of international trade. . . and the contribution this makes. . . to the promotion and maintenance of high levels of employment and real income and to the development of the productive resources of all members. . . .

In the last quarter century members have benefited from their cooperation in a wide range of monetary, trading and other economic relationships. These cooperative efforts need to be carried further and redirected in various ways. Action may be required not only in the payments field, which is of prime concern to the Fund, but also in respect to the rules governing trade, investment and aid in which other organizations also are involved. In considering appropriate action in each of these fields it will be necessary to be aware of the close interrelationships among them.

Particular attention should be given to the interests of the developing countries. Full account should be taken of various features of any new international monetary system that might involve special problems for the developing countries. In addition, consideration should be given to whether and how a direct contribution might be made in the framework of the reform to the needs of the developing countries for additional financial resources.

The Developing Countries and the International Monetary System

Two aspects of monetary reform are of particular relevance to the developing countries: "the development of the productive resources of all members" and "the expansion and balanced growth of international trade." The rate of growth in the developing countries is still not sufficient to narrow the gap between them and the industrial countries, and their share in world trade has declined. While these unsatisfactory circumstances have been partly attributable to basic economic and other factors in these countries, they have been compounded by difficulties of access to markets and an inadequate flow of capital to developing areas.

Financial and economic developments in the second half of 1971 illustrate the proposition that all countries are affected when the international monetary system ceases to function smoothly. The events that followed the actions taken by the United States on August 15, 1971 affected the developing countries in a number of ways. Some of them were affected directly by the 10 percent surcharge on dutiable imports into the United States. For all of them, the relative fluctuation in the exchange rates for major currencies posed new problems and uncertainties with respect to their own exchange rates, the management of their reserves, the prospects for their terms of trade and even their development plans. Moreover, the uncertainties in the world economy which followed from the monetary upheaval appear to have reinforced the effects of the slow pace of growth of several industrial economies in depressing the prices of primary products in the last few months of 1971.

Some of these difficulties have now been overcome, and the renewed expansion in the U.S. economy and in other developed countries has improved the export prospects of the developing countries in general. But the experience underlines the major interest of the developing countries in a sustained economic expansion in the industrial countries and in the effective functioning of the system. The developing countries would have much to gain from a steadier growth of the economies of the industrial countries. The particular policies employed by the industrial countries are also relevant in this respect. In recent years the developing countries have been unfavorably affected by the higher cost of credit in international financial markets, attributable to some extent to the considerable emphasis by industrial countries on monetary policy in programs of financial restraint. Furthermore, there has been a sluggishness in the overall flow of official capital and aid, related in part to preoccupations in many industrial countries with problems of inflation, budgetary pressures and balance of payments difficulties, as well as to non-economic factors. One result of this may have been a tendency for some de-

veloping countries to resort to shorter-term debt on relatively expensive terms.

The vital interest of developing countries in the functioning of the international monetary system requires the substantive participation of their representatives in the international formulation and negotiation of proposals to reform it and of any associated proposals relating to international trade. This interest has found an expression in the support on the part of the developing countries for the establishment of the Committee of the Board of Governors of the Fund which is to concern itself with reform. [Note: This is the "Committee of 20" which is holding a series of meetings beginning November 1972 and lasting perhaps two years in an effort to reformulate the monetary system. Developing countries are given a substantial voice among the "20."]

Aspects of the world's trading and monetary system of particular importance to the developing countries include freer access for their products to the markets of the developed countries on more satisfactory terms; a steady and enlarged flow of official foreign aid; and adequate access to capital markets accompanied by measures on the part of both developed and developing countries to encourage, rather than limit, the flow of private development capital in various forms and on mutually beneficial terms. The developed countries for their part have a direct interest in the economic expansion in the developing world. The rise in incomes and purchasing power generated by such expansion provides opportunities for an increased and mutually advantageous expansion of trading and investment relationships between the two groups of countries. If, through appropriate policies, such expanding relationships could help to maintain high levels of trade and economic activity, this should also assist the adjustment process and contribute to the stability of the international monetary system itself.

With respect to international monetary arrangements in general, the developing countries have for the most part expressed a strong preference for the officially established par values for exchange rates, with narrow rather than wider margins. [Note: These margins refer to the percentages above and below par values within which market rates may fluctuate without a country's being required under Fund rules to intervene to restore stability of values. Narrow margins would reduce fluctuations in value.] Although recognizing the disadvantages to them of delays in needed par value adjustments in developed countries, developing countries have laid particular stress on the difficulties caused to their own economies by fluctuations in the exchange rates for major trading currencies. As regards their own exchange rate policies, opinion is more mixed. Many of the developing countries have attached high priority to the

maintenance of a par value for their currency. Others, less able to control domestic inflation in the short run, have made frequent downward adjustments in the external value of their currencies.

The developing countries have tended to hold their reserves predominantly in foreign exchange rather than in gold, considering the interest income on the currency balances held as an important offset to the opportunity cost involved in holding reserves. A decision to raise the interest rate on SDRs—as a means of encouraging increased holdings of SDRs—would have special implications for the developing countries. These countries have been substantial net users of SDRs and may be in a similar position in future: thus a rise in interest rates on SDRs would increase the interest costs that these countries bear. [Note: Countries are allocated SDRs in proportion to their quotas in the Fund. They pay charges on the net use that they make of SDRs in international payments and receive interest on holdings of SDRs that exceed their cumulative allocations.]

The International Monetary System and the Supply of Financial Resources to Developing Countries

One major aspect in which the needs of the developing countries are being inadequately met is in the provision of development finance. This is a matter of widespread concern because this constraint on their economic growth inhibits balanced growth in the world economy as a whole. The question has been posed as to whether the total supply of development resources could be supplemented by the provision of financial resources for development through the international monetary system, and whether such action would be compatible with the effective functioning of the system. The most widely discussed proposal has been that of a "link" between SDR creation and development finance. This issue can be approached more broadly, however, to encompass a number of possible approaches intended to provide additional financial resources to developing countries. A few such possibilities are:

(1) The allocation of SDRs by the Fund to development agencies, to be used by these agencies in their operations on the basis of internationally established rules. This approach would entail fluctuations in the flow of SDRs to development agencies in accordance with variations in the decisions on the need for global SDR creation. Alternatively, the amount to be put at the disposal of development agencies could as far as possible be kept stable in the short run, with other SDR allocations absorbing any variations in the total amounts created.

(2) Maintenance of the principle that SDRs would be allocated only to IMF participants, but with an agreement among the countries with

high per capita incomes to transfer to development agencies either part of the SDRs allocated to them or the equivalent in currencies.

(3) The adoption of a new formula for the allocation of SDRs among countries which would not be strictly proportional to Fund quotas, as is the present formula, but would channel to the developing countries a larger share of total allocations than corresponds to their share in Fund quotas.

(4) An adjustment of the Fund's quotas that would raise the share of the developing countries in aggregate quotas. This would raise these countries' participation in SDR allocations without a change in the distribution formula and, in addition, would increase the other benefits of their membership in the Fund, including access to conditional liquidity in the General Account and their proportion of voting strength.

To make a full appraisal of the relative merits of the various possibilities listed, certain economic and financial as well as technical and institutional aspects need to be considered. A study of these and a number of related questions has been undertaken and will be transmitted to the Board of Governors by the Executive Directors as soon as it has been completed.

[Summarized from Reform of the International Monetary System: A Report by the Executive Directors to the Board of Governors. Washington, D.C.: International Monetary Fund, August 18, 1972.]

Special Drawing Rights: \$10 Billion for Whom?

James W. Howe

[The case for revising the IMF formula for distribution of SDRs so that more of their benefits will go to developing countries is presented. Closely related questions discussed here are whether some SDRs should be allocated via international development agencies, and whether they should be paid for with foreign exchange rather than distributed free as at present.]

During the next year or two, the International Monetary Fund must decide whether to renew its Special Drawing Rights (SDRs) program, and, if so, for how long and at what level. In the past three years, more than \$9 billion in SDR assets has been created. As might be expected when the distribution of assets worth billions of dollars is at stake, a certain amount of elbowing of the rib and gouging of the eye will take place. The full battle has not yet been joined, although there have been a few skirmishes.

The Arguments for Reform

Thus far, SDRs have been distributed free of charge to IMF members in proportion to their quotas, representing their respective shares of the total amount of money put up by member countries in 1944 when the IMF was established, and subsequently amended as new countries joined. The quota system also corresponds (but not precisely) to each member's share of the vote in the IMF. Under this distribution formula, the 25 industrialized countries, with 67 percent of the vote, have received 75 percent of the SDRs. The re-

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maining 87 participants in the system—all less developed countries (LDCs)—have received only 25 percent of the SDRs.

This distribution formula has been criticized by an increasing number of commentators on two grounds. First, it is rather conspicuously unfair to give a large share of a valuable free asset to the rich minority, leaving only a small fraction for the large poor majority. If the distribution formula were revised, \$2 billion or \$3 billion per year might go to the poor countries. And second, it is an inefficient means of achieving the main original purpose of the SDR scheme, which was to make the international economy work better. Changing the formula could help make the world's economy work better in several ways.

Reducing barriers to trade. To begin with, the SDR system was designed to put foreign exchange in countries where it is needed, to lessen the chance of their resort to harmful policies such as the imposition of tariffs and other barriers to trade and investment. It was intended to help reduce these practices by increasing the volume of foreign exchange and thus relieving the anxieties that might lead countries to adopt restrictive practices. But SDRs can, and should, be distributed to countries in such a way that they will also reward good economic practices and penalize poor ones. The present distribution formula simply gives each member of the IMF its quota of SDRs—whether it needs liquidity or not, and whether or not it is following practices that are sound from the international point of view.

Moreover, by giving members this new reserve asset free of charge, the present SDR formula relieves those members who would otherwise have a balance-of-payments deficit of the need to apply to the regular window of the IMF for convertible currencies, which gives nothing away but rather lends foreign exchange only after a careful review of the internal and external economic policies of the borrowing country. If SDRs are simply given away, this valuable international disciplinary tool may be lost in some cases. Therefore critics argue that countries should "earn" SDRs by exporting. This would be an incentive to keep their exports competitive either by devaluing their currencies when warranted, or by keeping down inflation and improving the quality of their products.

Some of the present system's critics also argue that SDRs should be distributed in a way that would give the new purchasing power predominantly to the poor countries rather than to the richest ones, as is done at present. Poor countries tend to suffer more from chronic shortages of foreign exchange than do rich countries. This is so because they always need more imports to help them develop than they can pay for with exports. This predicament tempts them

to put barriers in the way of imports that compete with domestic production, and thereby to protect very inefficient industries. In the long run, continual resort to these defensive trade barriers, even if each one is insignificant by itself, can bring cumulative distortions in world trade and production patterns, making all countries worse off than before. Giving more SDRs (or their equivalent in other assets, as explained later) to poor countries should discourage their resort to protective barriers.

Reconciling rich countries' trading goals. A second important reason for allocating more of the new purchasing power to poor countries is perhaps more persuasive, since it would benefit the developed countries themselves. A revised formula would help reconcile a serious conflict in the rich countries' trade policies. In recent years, each of the major developed countries has insisted on exporting more than it imports. Taken together, the rich countries would like to run surpluses (more exports than imports) amounting to about \$15 billion to \$20 billion annually. This policy is partly intended to increase reserves of foreign exchange, but it is also associated with the domestic employment implications of production for export, and with the widespread feeling in the United States—intense beyond all rationality—that foreign firms are taking unfair advantage of U.S. domestic labor when imports exceed exports.

In any case, it is obviously impossible for each of the rich countries to run a surplus with respect to each other, since for every surplus there must be an equal deficit. The only way these countries can run greater foreign exchange surpluses than deficits is by exporting more goods to the poor countries than they import from them. This would kill two birds with one stone, since it would also enable the poor countries to import the materials, machinery and expertise they need for their countries to grow. But there is one major catch to this approach. Although the poor countries are willing to incur a trade deficit (import more than they export), they cannot finance it. They simply do not have enough dollars or gold to pay for it.

In one form or another—through loans, grants, credits and investments—rich countries for many years have been financing a big trade deficit for the LDCs. One of the reasons they have been doing this is because they want the poor to buy exports that other rich countries will not buy. In fact, the poor countries could run even greater trade deficits (and the rich countries get rid of even more surplus exports) if more financing were available. Clearly SDRs could be part of the answer, in that they could provide some of the necessary financing. To do this, however, the distribution formula would have to be revised to give more purchasing power to the poor countries.

Encouraging sound LDC economic practices. Many different specific reforms of the SDR system have been advanced. Prominent among these is the suggestion that a portion of the SDRs be allocated to the World Bank and perhaps also to the three regional development banks (the Inter-American Development Bank, the Asian Development Bank, both in full operation, and the newly formed African Development Bank). These banks could then sell the SDRs for convertible currencies to countries desiring them (presumably the developed countries) and use the assets received for making loans to poor countries on easy terms. Thus countries receiving the SDRs would have earned them, and a flow of resources to the poor countries would be set in motion. Programming SDRs through these banks (rather than merely making them directly available to the poor countries from the IMF) would give the poor countries an incentive for good performance. They would have to meet the criteria of the banks for sound projects and economic policies. Additional criteria also might be specified to ensure sound trading practices as well.

Under another possible scheme, the banks could make SDR loans to poor countries—e.g., a loan of \$10 million worth of SDRs to Panama to build a road. This would set in motion three steps: (1) rich countries would bid for the road construction contracts financed by the loan, (2) goods and services would flow from the winning bidders to Panama to build the road, and (3) SDRs would go from the banks to the rich countries which had won the bids.

There are advantages and disadvantages to each of these variations—and to a dozen others as well—but these matters need not concern us here. The key point is that any of these schemes would encourage the poor countries to follow sound economic policies (because they would have to meet the banks' loan requirements) and would, in addition, move real assets from rich countries to poor.

Opposition to Reform

Strong objections have been raised to revision of the present SDR formula. In the early stages of SDR creation, the leading argument against change in the formula was that first consideration must be given to establishing acceptability of SDRs as an asset "as good as gold" for international payments. As the SDRs have become accepted and used in practice, this argument against change has receded in importance, and others have emerged.

Overloading the negotiations? Some opponents of SDR reform maintain that there is already a burdensome negotiating job ahead in reforming the monetary system—including items such as flexibility, exchange rate alignments and convertibility of the dollar. To add to this task the burden of reforming the formula for distributing

SDRs might overload the negotiations. Americans who make this assertion usually add that if it were up to the United States alone, reform of the distribution formula would be possible. It is the Europeans, they say, who are opposed. This point was weakened at the recent UNCTAD meeting in Santiago, where several major European powers announced cautious interest in such reforms. Moreover, recently this argument has come to cut both ways. Any change in the SDR formula required 80 percent of the weighted vote, which must also include three-fifths of the member countries. Since the same is true for the monetary reforms desired by the rich countries, the poor countries may refuse their cooperation without some reform of the distribution formula favorable to them. Their keen interest in the subject at Santiago suggests that this is a real possibility. This possibility is strengthened by the inclusion of nine representatives of developing countries in the newly formed "Committee of 20" which is shaping the reform package. Thus, while it may burden the negotiations to include this reform, it may equally burden them to leave it out.

The inflation argument. Would allocating more benefits to the LDCs be inflationary? There are two parts to this argument. First, if LDCs get a windfall out of the SDR system—even indirectly through expanding the financing of international banks—this will make them want a still larger volume of SDRs, which could be inflationary. It must be conceded that they might indeed ask for more, since a larger volume of SDRs would give them more resources. However, two factors would discourage an excessive volume from actually being created.

The LDCs have only a minority vote in the actual decision-making. Their vote amounts to 33 percent, and it takes a majority of 80 percent to make the decision to create new SDRs. Thus, the LDCs could not force through a plan to create too many SDRs. On the other hand, they could veto an SDR scheme if they thought it would create too few SDRs. Since that would give the poor countries no resources at all, it is unlikely they would actually take this step, but it is a possibility. It is just as possible for the Common Market countries to do the same if the volume did not suit them. Pressure for excessive issuance might be discouraged by amending the IMF charter. Before accepting the redistribution formula, the rich countries could insist that the IMF incorporate into its Articles the principle that volume of SDR issuances is to be governed only by the need for liquidity and not by the need for development resources. Thus, any explicit effort by LDCs to create additional SDRs to meet development needs would be out of order under the IMF's Articles.

Turning to the second part of the inflation argument, it is often stated that, for any given volume of SDRs, more worldwide demand

for goods would be generated by one of the proposed new allocation formulas favoring LDCs than by the present one. In all probability this is true. Indeed, since one of the two major purposes of the redistribution formula is to move resources from the rich to the poor, total world demand should go up. Would this cause inflation? It should not, provided that the demand is directed to countries having unused productive capacity—such as the United States at present. But to some extent demand would be directed to countries whose factories, farms and labor force were already fully employed, and this would have an inflationary effect on such countries.

To judge the importance of both parts of the inflation argument, let us set up and compare two simple examples. First let us assume, with a degree of deliberate exaggeration, that under the new formula SDRs are created at an annual average of \$5 billion per year—a \$2 billion expansion over present levels. The reason for the increase in this example is to allow for the possibility of LDC pressure for a larger volume. Let us also assume that all of the SDRs, or their equivalent in currencies, are given to the international banks, and that the entire issuance of \$5 billion expresses itself in added demand for the world's goods.

Second, let us compare this example to the experience of the past two years, when only \$3 billion of SDRs were distributed, according to the present formula. Only a little less than one-fourth of this original SDR issuance—or \$0.75 billion—expressed itself in added demand for the world's goods. The reason for this was that only about one-fourth of the SDRs were used; the rest were held by their recipients as reserves. Thus the new formula, with its assumed expansion in the volume of SDRs, would generate \$4.25 billion more current demand than the present one. The main difference between the two formulas, of course, is that under the new system SDRs would not be held in reserve by individual countries, as they would be channeled through the international banks, and we are assuming that they would be used up in the same year.

How much of an inflationary impact would even these deliberately exaggerated numbers have? The total annual demand in developed countries (excluding Communist countries) was \$1,866 billion in 1969. Even if we assume that all of the increased demand of \$4.25 billion would quickly wind up in the developed countries of the free world (again exaggerated), the inflationary impact on them would be a little under one-fourth of one percent of total demand. Even if those developed countries with full employment happened to experience twice as much impact (got twice as much of the additional business) as the average participating country, the average inflationary pressure on them still would be well under one-half of one percent! Clearly the inflation threat has been considerably exaggerated.

Offsetting cuts in aid? It also has been suggested that funds generated by a redistribution formula would merely substitute for aid funds. Certainly there would be pressure in the U.S. Congress to cut U.S. contributions to the International Development Association (IDA) if a change in the SDR distribution formula provided funds for IDA. The same might be true of contributions to other international development banks if SDRs generated funds for them. However, the Congress seems to need no excuse to make cuts in aid. By contrast, if the SDR formula were revised to make only half of a \$3 billion SDR issuance available to the banks, this would still give them about 50 percent more resources than they now receive from U.S. appropriations. Given the amount of anguish involved in getting appropriations, and their serious uncertainty, the specter of offsetting cuts is not a powerful argument against reforming the SDR distribution formula. Nor is the argument any stronger when other aid donor countries are considered.

Unpredictability of resource flows? It has been argued that during periods when fewer additional SDRs are needed for liquidity, the international financial institutions dependent on the SDR creation might suffer. Indeed, some economists believe we may be entering such a period now. The argument is that if aid appropriations to the international banks were once discontinued, it would be hard to start them again. In the United States, however, the reverse might be the case, particularly if it were clear that the need to reactivate appropriations were a one-time phenomenon caused by a temporary failure of the SDR system to generate funds. The regular annual appropriations process for U.S. aid seems to have generated a cumulative resistance; so the argument that SDR-generated funds might fluctuate is not very compelling.

Loss of congressional control? It also has been argued that the redistribution formulas are an evasion of parliamentary control over aid. Yet this objection contains two fallacies: first, that the resource flow under the SDR system is "aid," and second, that Congress has "control" over such flows at present.

It is interesting that the 25 percent of SDRs now allocated to poor countries is not thought of as "aid"—nor, for that matter, is the 75 percent which goes to the developed countries. Yet any proposal for increasing the share of the benefits going to LDCs is almost always referred to as "aid" by proponents as well as opponents. Why should this be the case? The most likely reason is that people regard the present 75 percent as "belonging" to the developed countries. Anything that belongs to us which we give up to others is "aid." In fact, however, the 75 percent does not "belong" to the rich countries, since it was allocated to them arbitrarily in accordance with their quotas in the IMF. And the quota system itself, as we have seen, is

by no means uncontroversial. It reflects who has the power. It is hardly fair to call the benefits of the system "aid" only when the poor rather than the rich get them. In any event, no revision of the distribution formula would change the degree of parliamentary control over it. Under neither system do parliaments control the allocation of SDRs or the movement of resources—although they would be asked to approve any decision to change the distribution formula.

Conclusions

My own main conclusions are that 1) the possible disadvantages attributed to reform of the system for distributing SDRs have been exaggerated, and that 2) SDR reform offers several possible advantages that cannot be guaranteed in advance but are very promising. These advantages include reducing barriers to world trade, helping the developed countries reconcile their own conflicting trade goals, and encouraging the poor countries to follow sound economic policies. A further advantage of the reform—one which needs no proof—is that it obviously would be more fair to the poor countries than the present system.

[Excerpted from "Let's Spread Them Around" in "SDRs and Development: \$10 Billion for Whom?" Foreign Policy. New York, N.Y.: National Affairs, Inc., No. 8, Fall 1972, pp. 102-112.]

The Use of Special Drawing Rights by Developing Nations

Danny M. Leipziger

[The actual use of SDRs by developing countries during the last three years have averaged about one third of the totals available. SDR acceptability as a reserve asset is explained.]

Special Drawing Rights (SDRs) are additions to the stock of international liquid reserves, first created by the International Monetary Fund in January, 1970. The initial creation of U.S. \$3.5 billion has been followed by subsequent additions of these fixed value assets of U.S. \$3.0 billion in January, 1971 and January, 1972. SDRs can either be held as international reserve assets or used to purchase convertible currency within a framework of Fund rules. The rules governing such transactions are that a country may use up to 70 percent of its allocation to meet balance of payments needs without "reconstituting," that is, replenishing its SDR stock later. The country must pay 1-1/2 percent per annum interest cost on this used portion. If more than 70 percent is used, the SDRs must be replaced so that the average holdings of SDRs over a five-year period are not less than 30 percent of the total allocation.

SDRs have been allocated on the basis of IMF participation quotas: the Less Developed Countries (LDCs) among IMF members obtained 25 percent of each SDR creation. (This differs from the overall 27 percent

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LDC quota share, since Ethiopia, Kuwait, Libya, Saudi Arabia, Singapore and Taiwan declined to participate.) Considerable interest has been expressed in the use of SDRs by the LDCs, especially in light of current discussion on increased SDR allocations to LDCs. An examination of patterns of SDR use and the degree of acceptance of SDRs as a reserve asset is important for two reasons. First, there has been a concern that increased allocations of SDRs to LDCs will lead to a one-for-one increase in the use of SDRs, with inflationary effects on the developed countries. Given the relative magnitudes involved it is doubtful that any inflationary effect will result, irrespective of what the LDCs marginal propensity to use SDRs might be. Discussions on the link have commonly assumed without empirical investigation that this propensity is one. If the marginal propensity to use SDRs is shown to be less than one, the credibility of the inflation argument against higher SDR allocations to LDCs is further weakened. Second, opponents of a link between SDR allocations and development assistance have argued that SDRs are a recently invented reserve asset whose acceptability has not been proven, and hence it is unwise to burden it with a second resource transfer function. While the question of compatibility of the role of SDRs as reserve assets and their potential role as an instrument of resource transfer is a larger issue not discussed in this paper, it is central to this issue to ascertain how good an asset, *vis à vis* foreign exchange and gold, SDRs have actually been. In this study, therefore, we attempt to explore the determinants of SDR use and analyze the role of SDRs in LDC reserve portfolios.

Extent of SDR Use

The amount of SDRs used by LDCs over the first three years of experience with this asset (1970-72) has averaged a fairly constant 34 percent of the amounts allocated. The LDC regions, however, have exhibited quite disparate SDR use patterns. Table 1 indicates the total dollar amount of SDR allocations, the proportions used and the marginal propensity to use SDRs out of successive allocations (MPU), measured six months after each allocation, for all LDC members of the IMF and for the major LDC regions. Latin America, and to a lesser degree Africa, with initially low MPUs, exhibited rising MPUs over time; while the Middle East, and to a lesser extent Asia, which used substantial portions of their SDRs at first, displayed falling MPUs over time. It should be noted that none of these groups have shown a tendency to use their SDRs at a rate close to 1.0 for any length of time, a finding which bears on the anti-inflation argument against reallocating larger proportions of SDRs to the LDCs.

Supply and Demand Factors in SDR Use by LDCs

In considering the factors that may have caused countries to use varying amounts of their SDRs, the most obvious is the supply of

Table 1 - SDR Use by LDCs, 1970-72

<u>Total LDCs</u>	<u>Total Allocation</u>	<u>%SDR Used^{a/}</u>	<u>MPU^{b/}</u>
July, 1970	\$ 853.1 m	34%	34%
July, 1971	1,600.6 m	36%	38%
July, 1972	2,348.0 m	34%	30%
<u>Latin America</u>			
July, 1970	330.0 m	10%	10%
July, 1971	605.8 m	18%	28%
July, 1972	879.1 m	31%	63%
<u>Middle East</u>			
July, 1970	77.4 m	86%	86%
July, 1971	158.4 m	66%	43%
July, 1972	239.4 m	49%	-116% ^{c/}
<u>Asia</u>			
July, 1970	277.7 m	51%	51%
July, 1971	520.1 m	50%	49%
July, 1972	765.0 m	33%	0%
<u>Africa</u>			
July, 1970	168.0 m	28%	28%
July, 1971	316.3 m	33%	39%
July, 1972	464.5 m	40%	45%

a/ Cumulative total of SDRs used by a given date as a percentage of the cumulative total of SDRs allocated up to then.

b/ SDRs used in the year preceding given dates as a percentage of SDRs allocated in the same year. Annual allocations were made in January 1970, 1971 and 1972.

c/ A negative use figure means that the countries in question added to their SDR holdings during the period by more than their allocation.

SOURCE: International Monetary Fund, International Financial Statistics (Sept. 1970, 1971, 1972), p. 7.

these assets at their disposal, i.e., the size of their SDR allocation. This is the largest explanatory factor in statistical terms: countries with the larger allocations tend to use larger absolute values of SDRs. The allocation formula, of course, gives larger quantities to countries with the larger trade and GNP values.

Concerning the demand factors in SDR use, it appears—as could be expected—that countries with the worse balance of payments situations tend to use more SDRs. Annual SDR use is positively correlated with the net balance of payments (current plus capital account) deficit of countries in the preceding year. A related finding is that SDR use is also correlated with net losses in non-SDR reserve holdings in the preceding year. [NOTE: presentation of these statistical results within a more complex multi-variable model is planned for future publication.]

The Role of SDRs within LDC Reserve Portfolios

As a converse of the preceding sentence, it may be noted that reserve increases will tend to augment the size of SDR holdings in a country's reserve portfolio. It must be stressed, however, that SDRs have been accumulated both by countries losing reserves and countries gaining reserves. In considering whether such increases are regarded as a substitution of SDRs for gold or for foreign exchange, a difference may be noted between Latin America and other LDCs. In Latin American portfolios, countries holding more foreign exchange in proportion to gold will tend to use more SDRs, suggesting that SDRs are considered substitutes for foreign exchange. The opposite is true of the Asian and African countries, where higher foreign exchange proportions to gold are associated with lower SDR use, supporting a theory that in these regions the SDRs are considered gold-substitutes.

It is clear that SDRs are beginning to play a significant role as reserve assets. Inasmuch as the Fund rules on SDR use tend to induce reserve gainers to hold SDRs and the arbitrage possibilities tend to encourage reserve losers to use SDRs, we are not able to test the superiority or inferiority of the SDR as a portfolio asset. Our basic observations, however, are that:

- 1) the expanding role of SDRs in LDC reserve portfolios is primarily associated with a declining role for foreign exchange and to some extent gold;
- 2) reserve gainers in Latin America seem to maintain these foreign exchange proportions, while the Asian-African reserve gainers seem to prefer SDRs;

3) reserve losers in all LDCs run down their foreign exchange and seem, on average, to hold more than the minimum allowable level of SDRs;

4) reserve-richer Latin American countries tend to hold higher gold proportions, while reserve-richer Asian-Africans tend to hold higher foreign exchange proportions. This fact would seem to explain why SDR use was positively related with the foreign exchange-to-gold ratio in Latin America (richer Latin American countries tend to have lower FX/G ratios) and negatively elsewhere (richer Asian-African countries tend to have higher FX/G ratios).

Our findings suggest that SDRs have received general acceptance as an LDC international reserve asset and are playing an increasingly important role in LDC reserve portfolios. Inasmuch as LDCs are a diverse group, their pattern of SDR use and reserve compositions vary considerably. Irrespective of these differences, however, LDCs did not exhibit a negative preference for holding SDRs relative to other reserve assets. The patterns of reserve asset management, it must be recalled, were in part the result of the existing framework of rules which encouraged SDR use by deficit countries and discouraged SDR use by surplus countries. If unconstrained SDR use by all countries within the limits of their total allocation were allowed, a larger portion of SDRs would probably be used. Conversely, an increase in the interest cost of using SDRs is likely to dampen the attractiveness of their use. Assuming, however, that the regulations affecting SDR use remain unchanged, nothing in our analysis suggests that increased allocations of SDRs to LDCs will lessen the value of SDRs vis à vis other reserve assets in LDC reserve portfolios.

[An original article.]

An Agenda for Monetary Reform

Tom de Vries

[The current international monetary system is in flux and needs more than a patching up of the system here and there. A complex package of interrelated reform measures is called for: both the role of the dollar, which was at the center of the old system, and the exchange rate system, and perhaps also the role of gold, will have to be redefined. NOTE: The following excerpts do not include the author's complete "agenda" for reform.]

Successive monetary systems have come into being mainly by a process of spontaneous evolution, and without purposeful direction aimed at deliberately creating a system on the basis of a well-defined plan. This is evident even from the most summary look at history. The gold standard emerged from a series of partial decisions in different countries, with no considered agreement on the question of whether gold, silver, or bimetallism should serve as the basis of the world's monetary system. The establishment of the gold standard in England, which led the way, was influenced decisively by the failure of a series of measures to retain silver rather than gold as the standard metal. After the principal European countries moved to the gold standard shortly after 1870, largely as a matter of prestige, the debate on whether bimetallism was not after all preferable to gold continued until about 1890, when the discovery of the rich gold mines of Transvaal put an end to the prevailing gold shortage and thereby to the debate. France, conservative as always in monetary matters, kept on promoting the role of silver as much as the circumstances permitted. There was no official doctrine at

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all concerning regulation of the deposit money created by the commercial banks, although it increasingly dominated domestic money circulation. Indeed, the money-creating role of the commercial banking system was not generally recognized until the twentieth century. The financial management of these private banking institutions was based, for a long time, on rules of thumb developed in practice.

Nor did the gold-exchange standard, which succeeded the gold standard, stem from a deliberate decision to introduce such a system. It developed spontaneously toward the end of the nineteenth century, particularly in transactions between the European mother countries and the Asian colonies where silver had remained predominant. To be sure, the League of Nations recommended the system for some years after 1922, while the United Kingdom promoted the role of the pound sterling as a reserve asset. But the enormous expansion of the gold-dollar standard after 1945 [i.e., the widespread use of dollars as reserves, along with gold, with gold-dollar convertibility at a fixed rate] came into being quite spontaneously, parallel to the system designed at Bretton Woods, as a result of the postwar economic power of the United States and the concentration of 70 percent of the world's monetary gold stock in that country. The suspension of the convertibility of the dollar into gold on August 15, 1971, together with the Washington agreement of December 18, 1971 on the realignment of exchange rates, to be maintained for the time being by means of official intervention with inconvertible dollars, has now ushered in a full-fledged dollar standard.

The fact that we have arrived at the dollar standard as the result of a temporary and partial solution of a problem is no reason to underestimate the importance of this development. Many previous "temporary" measures have formed the basis of permanent solutions. We should by no means exclude the possibility that we shall now once again witness this oft-repeated phenomenon. But neither may we exclude the possibility of taking concerted action to change the international monetary system. The establishment in 1969 of the Special Drawing Right (SDR) facility as a supplement to existing reserve assets, and the creation and use of this new reserve asset during the first "basic period" 1970 through 1972 constitute a striking example of what can be achieved by constructive international collaboration.

Alternatives to the Current System

Any attempt to return to one of the previous systems runs counter to the nature of the evolutionary process. The gold standard belongs to the past. A return to it is not only impossible, it is undesirable. Given the responsibilities that governments everywhere have assumed for the course of their national economies, a linking of monetary policy to the quantity of gold that becomes available for mone-

tary purposes—as the chance result of gold production, Soviet gold sales, and private, including speculative, demand for the metal—would be objectionable. The gold-exchange standard has just succumbed to the ailment that liquidity creation under that system undermines the financial strength of the reserve center—the pound in 1931 and the dollar in the 1960s and early 1970s. The dollar standard is unacceptable; there is general agreement, shared by the U.S. authorities, that the international monetary order should not be based upon a single currency. We shall therefore have to look for alternatives. In what follows, the outlines of one such alternative are sketched. As the scheme presented builds largely upon the SDR, it might be called an SDR standard.

Restoration of the Convertibility of the Dollar

A first question is whether the previous system could be made to work again by restoring convertibility of the dollar, that is, by returning to the gold-dollar standard. This solution appears impossible because it was precisely the steady erosion of the international financial position of the United States under the gold-exchange standard that forced the country to suspend convertibility in 1971. The U.S. gold stock amounts to no more than \$10 billion; the dollar balances in foreign official hands alone amount to nearly \$50 billion. Thus, the United States is no longer able to assure the convertibility of the dollar in its old form. It is conceivable that the United States might be able to restore its financial position through an extended period of payments surpluses, and it would certainly be a mistake to assume that the U.S. balance of payments can show only a deficit. However, for a long time a U.S. surplus would lead only to a reduction in the dollar balances held as reserves by other countries, not to an increase in the U.S. gold stock. Moreover, it is unlikely that the other countries would put up with substantial U.S. surpluses continuing for years, since that would imply large and continuing deficits on their part.

A return to the gold-exchange standard is not only impossible, but undesirable. The system has proved to be unstable as a result of the simultaneous existence of several reserve assets, and the consequent incentives for destabilizing switches out of one asset into another under changing circumstances. Efforts have been made to combat this instability by freezing exchange rates, especially those of the reserve currencies, with the result that the devaluation of both sterling in 1967 and the dollar in 1971 came years after they had become necessary, at great cost to the balance-of-payments adjustment process. In addition, a return to any gold-exchange standard would be a return to a system that does not permit of international control over the creation of international liquidity. Such control is thwarted by the creation of liquidity in

the form of the accumulation of dollar balances by other countries in the event of an American payments deficit (and similarly with other currencies), and the destruction of international liquidity in the opposite case. The enormous creation of international liquidity in 1970 and 1971 illustrates the point. In those two years, SDRs were allocated in the amount of \$3.5 billion and \$3 billion, respectively. The U.S. deficit, however, resulted in an additional creation of international liquidity of \$8 billion in 1970 and of no less than \$27 billion in 1971. Thus the actual increase in international liquidity far exceeded the planned increase.

Consolidation of existing dollar balances can eliminate the instability of the gold-exchange standard, permit control over liquidity creation, and allow the United States to earn reserve assets. In this connection, two matters must be clearly distinguished. In the first place, a demonetization of excess dollar holdings is called for. There are good reasons for assuming that the enormous rise in total international reserves during two years (from \$78.2 billion at the end of 1969 to about \$130 billion at the end of 1971) has led to an excessive supply of international liquidity. The demonetization could be effected by transforming these excess dollar balances into bilateral long-term loans to the United States. The rest of the dollar balances, representing a need for monetary reserves on the part of their holders, could be turned over to the IMF in exchange for SDRs to be created especially for this purpose. These SDRs would have to have the same properties as the SDRs now existing, or, if changes within the new framework proved necessary (e.g., regarding the rate of interest or the rules concerning acceptance limits, designation, requirement of need, and repurchase), these changes would have to apply to all SDRs.

It would be desirable to convert into SDRs not only all dollar balances, but also all official sterling balances and French franc balances, as well as official balances accumulated recently in other currencies. However, we shall no doubt come up against the problem that a rather sizable number of countries consider themselves so closely linked to either the U.S. or the British or the French economy that they will be unwilling to exchange their dollars, pounds or francs for SDRs. This preference for reserve currencies is connected with the close relations which are thus maintained with the money-market and capital-market institutions in the reserve centers. Hence, although participation by all countries would be preferable by far, and would considerably strengthen the system, we may have to limit ourselves to an arrangement in which only the major trading nations take part. But their participation will have to be complete if a workable system is to be achieved.

A consolidation arrangement will have a chance of success only if there is willingness to consolidate. Seeing to it that the exchange of

reserve currencies into SDRs does not result in a loss of interest payments received will foster this willingness. Hence, the rate of interest on SDRs should be increased; it should be harmonized with the yield obtainable in the principal reserve centers, New York in particular. In fixing the interest rate, account will also have to be taken of the advantage (or disadvantage) of holding reserve assets denominated in SDRs.

A further question to be considered is what is to be done with the considerable dollar, pound and perhaps franc balances that the IMF would receive under the consolidation arrangement. Since what is involved here is the counterpart of credit that the reserve centers have received, the obvious course is to ask for repayment of these credits. Since it would not make sense to bring about sizable balance-of-payments fluctuations, such amortization payments would have to be spread out over an extended period of time, say 30 or perhaps even 50 years. The redemption payments would be made in SDRs earned and accumulated by the former reserve centers in the course of their normal transactions.

Debt amortization through payment of SDRs to the IMF leads to a destruction of liquidity. From the monetary point of view alone, therefore, amortization is by no means necessary; on the contrary, it raises the question of how this destruction of liquidity is to be compensated for. Compensation could be achieved by an extra allocation of SDRs to all participants in the amount of the amortization payments. Or this extra allocation of SDRs could be used for an internationally agreed objective such as the financing of development aid, thus giving the developing countries a direct and concrete interest in the reform of the system. The advantage of this form of utilization of SDRs for the financing of development aid in comparison with other ways of doing so is that fixed amounts are involved, namely, the amortization payments to be made. Consequently, the determination of "international monetary policy," that is, the decision-making process as to the volume of the creation of new SDRs, is not encumbered by a conflict of interest between countries. Such a conflict would clearly arise if newly created SDRs, that is, SDRs created other than by way of compensation for SDRs received in payment by the IMF as amortization, were to be used for the financing of development aid.

The Exchange Rate System

The exchange rate system that was in effect until August 15, 1971, is known as the system of fixed par values. The par values, however, were fixed only until further notice, for they could be changed, with IMF approval, in the event of "fundamental disequilibrium." It is useful to distinguish the following possible arrangements for es-

tablishing par values for exchange rates: (1) unalterable parities, (2) jumping parities, (3) gliding parities and (4) no parities. When this distinction is made, it becomes clear that the differences between practicable alternatives are not as great as one might think at first.

Unalterable parities are impossible in practice. To maintain parities unchanged, it is necessary not only for domestic price movements due to inflationary pressures in the various countries to remain permanently in line with each other, but also for internal cost and price movements to adapt themselves fully to the changes made necessary by continuing structural transformations affecting the basic competitive position of all the countries concerned. One example of such a structural transformation is the introduction of entirely new products, which is occurring at a rapid but unequal rate in different countries. It has been estimated that in ten years' time some 50 percent of world trade will be in goods that are not yet being produced.

Thus, unalterable parities are out of reach. The other extreme alternative, no parities, has little to recommend it. Freely fluctuating rates, i. e., floating rates determined only by the supply and demand for currencies without any government interference, do not fit into the way modern economies are managed. National authorities consider it necessary to control many prices to attain their objectives, and the exchange rate, affecting as it does domestic prices, incomes and employment, is too important a price to be left unregulated. It is, for example, inconceivable that a government would stand idly by if unemployment were to occur in certain export industries as a result of an upward movement of the exchange rate caused by the inflow of money due to a temporarily higher domestic interest-rate level. Thus, fluctuating exchange rates free from official intervention are not to be expected, nor would they be desirable. On the other hand, international control over how and to what extent the national authorities would be allowed to influence exchange rate movements would be very difficult to achieve. Yet such control would be necessary, because the determination of the exchange rate in one country and the way it is being brought about (for example, through market intervention or exchange controls) conditions the relationships with its trading partners: one country's measures in this sphere directly and keenly affect the situation in the partner countries. It would therefore be necessary to agree on a set of rules and safeguards against arbitrary actions and conflicts of policy in the regulation of the floating exchange rates.

If we now assume that some kind of administered parity changes are called for, we must note that the experience of the past few years with large, infrequent parity changes has not been very favorable. Some disadvantages of the system may be summed up as follows. Big

parity changes take place in an atmosphere of crisis. Consequently, they are detrimental to the political prestige of the government in office. Prior to the event when a revaluation [an increase in the value of a currency] is expected, the authorities lose control of the domestic money supply to a significant degree as a result of the inflow of money from abroad. In the opposite case of an over-valued currency, there is a tendency toward unemployment. If either a revaluation or a devaluation has become necessary but is still being deferred, international trade and payments must be subjected to all kinds of restrictive measures. When the parity change is finally made, it is of such size that the import-competing and export industries are exposed to a grave and sudden shock. Last but not least, postponement of the decision offers speculators the opportunity to make substantial profits at the expense of the central bank, and therefore ultimately of the public purse.

The argument that maintenance of existing par values tends to promote economic discipline has only limited validity. The postponement of parity changes in recent years has not in practice prevented considerable and widespread inflation. In any case, discipline is encouraged by fixed rates only in the event of balance-of-payments deficits. Surpluses have the opposite effect, since in that case a country is faced with the phenomenon of imported inflation brought about by the maintenance of the existing exchange rate. More generally, the fixed exchange rate promotes discipline only if the international climate is one of price stability, and this has not been the case for many years now. Thus, it is precisely the German authorities who, to defend domestic price stability when inflation occurs elsewhere, have pressed for greater flexibility in the exchange rate system. Given these disadvantages of infrequent and large parity changes, the Executive Directors of the IMF called attention in 1970 to the possibility of smaller, and hence more frequent, parity changes. In point of fact, a development in that direction has manifested itself in recent years. In view of the experience with exchange rate changes since 1967, it is not likely that national monetary authorities will once again, as in prior years, start a grim fight to maintain unrealistic parities.

Nevertheless, it probably will not suffice to create the possibility for the authorities to take parity changes more lightly than they have done in the past and to make such changes more frequently. It is necessary, in addition, that the international community find ways to induce national authorities to change the par value of their currency when it has become necessary for balance-of-payments reasons. The question of how this pressure is to be organized is a difficult political problem that will require a great deal of further international deliberation. It is possible to prompt a deficit country to adjust its exchange rate by denying it further access to the

Fund's resources and other lines of credit. In the past, however, exactly the opposite policy was often pursued in important cases. In the years from 1964 to 1967, when the pound showed clear signs of overvaluation, Great Britain was urged to maintain the parity of the pound by all means, and was provided with liberal international financial assistance to pursue that policy. In the case of deficits, much would therefore be gained by a changed international attitude in such situations. In the case of surpluses, the present Fund Articles already provide the possibility, never used thus far, for the Fund to communicate its views to a member country regarding the monetary or economic developments there if the condition tends to produce a serious disequilibrium in international payments. The Fund may even decide, by a two-thirds majority, to publish such a report. An additional means of exerting pressure would be to reduce interest payments on the the SDR holdings of obstinate surplus countries or to reduce the size of their SDR allocations.

One of the difficulties involved in the use of such pressure is that it encourages speculative capital movements. Therefore, the exchange rate system can be expected to function well only if the authorities are willing to consider the rate of exchange as a normal instrument of economic policy and to adjust the parity in small steps (of not more than, say, 5 percent), without drama and without much of a political stir, when there appear to be reasonable grounds for doing so. If adjustments are delayed until there is complete certainty, speculators will once again have the opportunity for riskless speculation, opening the way for new monetary crises.

The "stability illusion" manifests itself in a tendency on the part of the public to behave as if exchange rates will remain fixed even though it is known that they may be adjusted. This stability illusion was operative for some 20 years after World War II. It was not disturbed by the 1949 devaluations, which were regarded as a once-for-all adjustment to the new relationships brought about by that war. It was somewhat impaired by the German and Dutch revaluations of 1961, and it was lost in the course of the multitude of monetary crises and parity changes since 1967. It would be banished completely by the system proposed here, which consists of: a) frequent, small changes in parities; b) a wider band of values around parity within which market rates are allowed to move without a requirement for government intervention to maintain stable values. This system may be called one of "gliding parities" to distinguish it from that of larger, more infrequent changes—"jumping parities"—as in recent years.

The expectation of frequent parity changes means that we must reckon with speculative money movements. In this connection, the relation between the width of the band and the normal size of parity changes under the reformed system is of vital importance. The

wider band increases the risk, and hence the economic cost, of acting in anticipation of a possible parity change. If, in addition to this, the profit that may be expected from correctly forecasting such a change is diminished by a general recognition that the ordinary changes in par value will be limited in size, short-term money movements are made less attractive. This would be all the more true if normal changes in parity were kept small enough so that the prevailing market rate would be within the band around the new as well as the old par value. In those conditions, abrupt adjustments of market exchange rates might be avoided. The question of whether the margins of 2.25 percent on either side of par (i.e., a band of 4.5 percent), agreed upon in Washington on December 18, 1971, are optimal from this point of view will have to be examined further in light of experience with them.

Greater exchange-rate flexibility does not mean that the international consequences of domestic monetary policy can be neglected, though it does afford national monetary policy more room for maneuver. However, large movements of the market exchange rate caused by divergent monetary policies are disruptive of current transactions. If, therefore, the system of "gliding parities" proposed here requires more coordination of monetary policies among countries than can actually be attained, serious consideration might be given to the introduction of a dual exchange market (already in operation in some countries) in which the market rate for capital transactions can show somewhat larger fluctuations than the market rate for current transactions.

Alternative to Reform

Carrying out such far-reaching reforms by way of international deliberation and negotiation will prove far from simple. But the monetary structure that came into being in December 1971 is unstable. If no agreement can be reached on constructive reforms, the process of spontaneous evolution will resume its course. It is likely that, if it proved impossible for the SDR to assume at least part of the central role played by the dollar under the old system, that role would be spread over a number of currencies. This would mean that the inconvertibility of the dollar would lead to renewed exchange rate fluctuations vis-à-vis the dollar. Some groups of countries would then try to stabilize the exchange rate relationships among themselves. Thus, the world economy would disintegrate into a number of regional blocs. This process would carry with it the obvious danger that the formation of economic blocs might lead to economic nationalism, to a tendency to inward- rather than outward-looking trade and capital-control arrangements, and in the longer run to an undesirable formation of political blocs. There would then also be reason to fear a dismantling of the International Monetary

Fund and a serious weakening of the institutional framework for international monetary and economic consultation and collaboration.

It is indispensable for a proper development of the international payments system that some countries in the world attend to its progress and evolution, in addition to concerning themselves with their own interests. Since the war, the United States in particular has played this important role. It should persist, but now it needs the full support of Europe and Japan, which have gained so much economic strength. If the readiness for full international cooperation exists, and there is good reason to believe that it does, there is ample opportunity to bring about monetary reforms capable of producing results for all countries concerned, including the Third World, that will far surpass the results of temporary and partial "solutions" or a spontaneous, unregulated evolutionary process.

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Exchange Rate Flexibility and the Developing Countries

Danny M. Leipziger

International monetary reform as currently envisaged in the IMF negotiations on the subject is largely centered on increasing the flexibility of exchange rates with more frequent, smaller par value adjustments. The basic objective is to avoid large, sustained balance of payments disequilibria. Recent proposals have been formulated to encourage exchange rate adjustments by both reserve-gaining and reserve-losing countries. Whatever the precise nature of the monetary reform that will be negotiated, some increase in flexibility of exchange rates is a likely prospect. We will first consider the effects of flexibility in the exchange rates of major industrialized countries on the developing countries.

LDC Interest in Stability

Export revenue is the prime stimulus and necessity for development. The less developed countries (LDCs) sell most of their exports to the industrial countries. Most of the former operate as small producers in their world markets, so that the world price in foreign currencies is largely determined by conditions outside the exporting country. These prices can be quite unstable, since demand factors (e.g., world income, substitutes, trade controls) are variable while price elasticities tend to be low in the short run. Furthermore, a country's supplies are uncertain due to weather and production factors, so that export revenue is to a large extent unpredictable. In this context, the additional variability introduced

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another article in this issue.

by more frequent changes in the par values of major world trading countries can only serve to increase the uncertainties of foreign currency receipts of LDCs.

Another area of LDC concern in connection with exchange rate flexibility is the repayment of foreign-currency denominated debt. It is estimated that the 1971 devaluation of the dollar increased the dollar value of LDC debt service and amortization payments denominated in other currencies by some \$2-\$3 billion in 1972. At the same time, however, studies have shown that the competitive gains in trading caused by the devaluation of currencies tied to the dollar were responsible for a net balance-of-payments gain to LDCs as a whole. Those countries whose currencies were tied to the dollar were unaffected in terms of dollar debt by the U.S. devaluation, but were hurt in terms of outstanding debt to other developed countries. Their trading position with the U.S. was unaffected, while their trading position vis-à-vis other countries whose currencies appreciated was improved. The countries whose currencies are tied to unchanged par values (currencies other than the dollar) gained in terms of their dollar debt, but lost in terms of trading competition vis-à-vis dollar prices. These results indicate that increased flexibility will undoubtedly exert pressure on LDCs to tie their par values more effectively with those of their major trading partners.

Methods of Dealing with Exchange Rate Risks

Individual traders will attempt to remove the added uncertainty due to possible par value readjustments surrounding future foreign currency payments or receipts. The normal procedure for traders in developed countries is to enter into forward exchange contracts which allow for sale or delivery of foreign exchange at a specified rate 90 or 180 days in the future. Naturally, there is a cost attached to buying "certainty," namely, the transactions cost of the contract as well as the premium or discount between the spot and future rates. (The spot rate is the price of foreign exchange for immediate delivery. A forward premium occurs where speculation is that an exchange rate might appreciate in the future, so that the forward rate for buying that currency for future delivery is higher than the spot rate; and conversely for a forward discount.)

The problem for LDC traders is identical. LDC trade is denominated in foreign units of account. Most of the variability in exchange rates is usually caused by the inflation-cum-devaluation problems of LDCs. There would now, however, be the added problem of par value changes in the major trading currencies. Let us assume that country A's exchange rate is not effectively tied to the U.S. dollar rate, but that the U.S. is a major export market for the country. Its exporters face the possibility of exchange rate losses from a de-

crease in par value of the dollar during the life of their sales contracts (the same calculation applies to transactions in francs, pounds, etc.). There are three principal ways in which this risk can be eliminated. Country A exporters expecting dollars in 90-180 days may: 1) enter into a forward sales contract for dollars, 2) take a 90-180 day dollar denominated loan, or 3) enter into an import contract with payment due in the same 90-180 days. Each of these methods has its cost. The option of contracting to sell dollars at a prespecified rate involves the previously mentioned operation in the forward market; the costs incurred are transactions costs, adjusted for the forward discount. The dollar loan repayable when the American importer pays, in let us say 90 days, might be secured with the commercial paper as collateral, or it might actually be discounted directly by a commercial bank. The cost here is either the lending or the discount rate for receiving the currency immediately rather than 90 days hence. A final option is to coordinate national export sales and import purchases, with the LDC central bank acting like a forward exchange market. Firms would discount their commercial paper with the LDC central bank and importers would contract to buy foreign exchange. In this case, the LDC itself has covered its future receipts with future obligations and has no net uncovered dollar position. This plan is similar to current operations in LDCs with strict exchange controls.

On the other hand, if an LDC's currency is effectively tied to the dollar and trade occurs primarily with the U.S., the U.S. rate's flexibility ceases to be a problem. (The same is true of other importers' currencies.) In this case, however, the LDC's domestic price level, which is heavily dependent on its export and import prices—involving exchange rates—become strongly affected by U.S. dollar flexibility policies.

It is fairly clear that increased exchange rate flexibility initiated by the developed countries will add somewhat to the problems of uncertain export revenue and foreign debt repayments. It is therefore likely to have some disturbing effects on development planning. The scope of these problems can be mitigated through the use of financing institutions in developed countries and by coordination of export and import transactions. It is also clear that LDC traders will need to operate more freely in exchange markets than some current LDC exchange restrictions permit. One might also foresee greater coordination of exchange policies between LDCs and their primary developed-country trading partners.

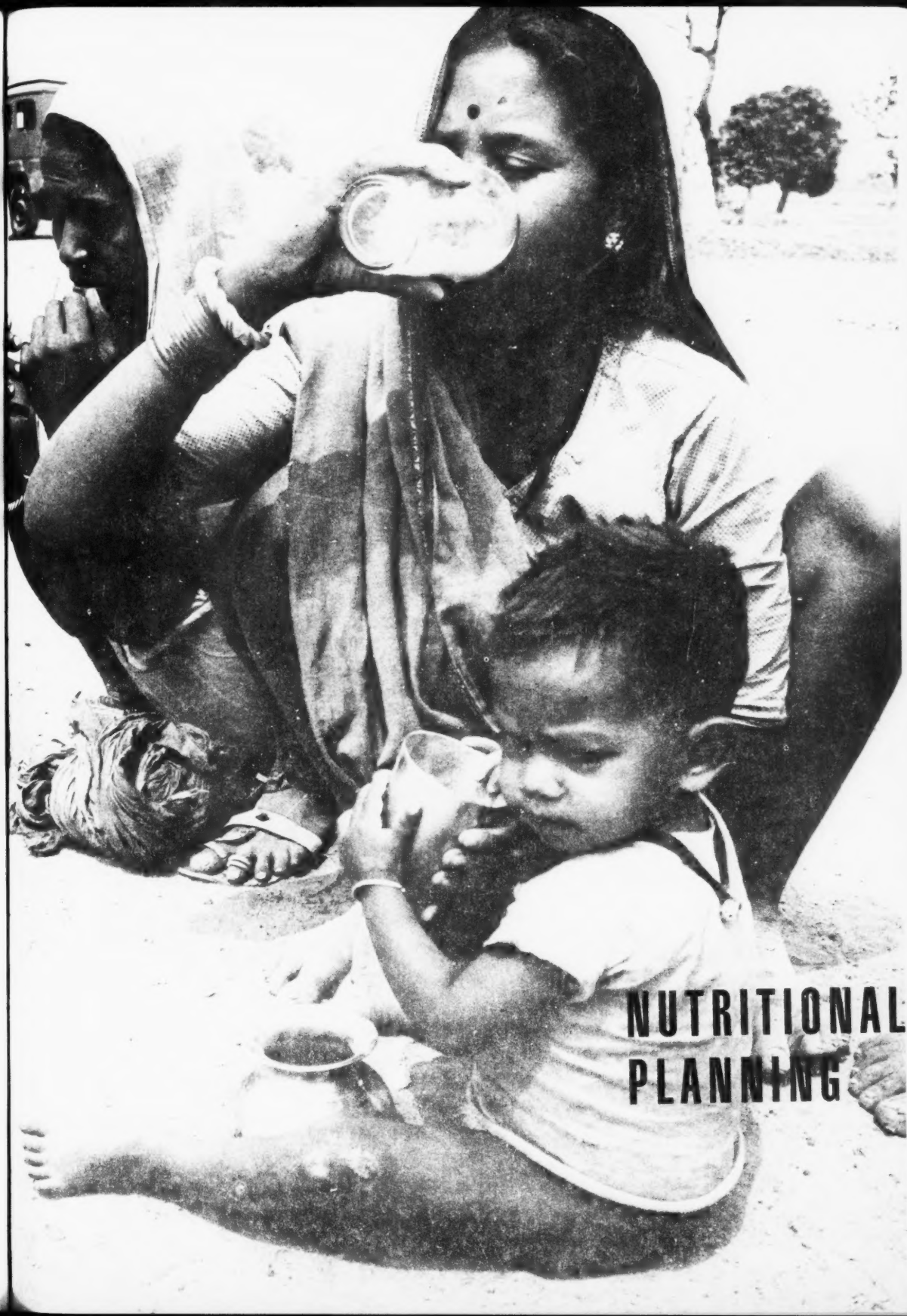
Flexibility of LDC Exchange Rates

Another aspect of the flexibility issue is, of course, the question of flexibility in LDC exchange rates per se. LDC par values have

tended to fluctuate substantially over time. Richard N. Cooper, in his Currency Devaluation in Developing Countries (Princeton University Series of pamphlets on International Finance, June, 1971) noted that of the 200 devaluations and five upward valuations of currencies in 1947-70 the great majority were by LDCs—partly because they are more numerous but also because, as a group, they devalued on average somewhat more frequently than did the developed countries. Nevertheless, because devaluations are politically onerous decisions, many LDC exchange rates remain consistently over-valued. Cooper's survey of three dozen LDC experiences with devaluation shows that in three quarters of the cases the countries' trade balances improved in the year after devaluation, but that over half of their finance ministers lost their jobs in that first year.

If newly developed IMF monetary guidelines favor frequent, small exchange rate adjustments in response to balance of payments disequilibria, the LDCs may then be urged to devalue more often. LDCs might feel that such devaluations are less effective in curing their payments problems than par value adjustments among the developed countries, since the price elasticities of world demand for LDC exports are rather low. They may also argue that payments balances in LDCs vary far more widely than in developed countries, and that much of the variation in their net balances may result from temporary or accidental causes—weather, short term price swings, etc.—so that exchange rate adjustment is inappropriate. Flexibility guidelines, therefore, involving both the direct LDC exchange rate adjustments and the indirect effects of par value adjustments by the large importing countries, are certain to be an area of concern to developing countries.

[An original article.]



**NUTRITIONAL
PLANNING**

EXPECTANT MOTHERS AND CHILDREN
PARTICIPATE IN INDIAN MILK
DISTRIBUTION PROGRAM.
[PHOTO: FOOD AND AGRICULTURE
ORGANIZATION OF THE UNITED NATIONS

The Efficient Use of World Protein Supplies

John C. Abbott

[This paper provides an economic context for appraisal of various protein foods and considers whether the world's protein resources are being used efficiently, and whether new protein foods are being introduced and marketed to the best advantage. Some general suggestions are offered.]

The production and marketing of foods containing protein are undertaken to meet evident market demands. World demand for protein in general is unsatisfied at present prices, and it will expand rapidly over the next 20 years from population increase alone without allowing for any rise in incomes in the developing countries. Effective demand, supported by disposable income and willingness to use it on protein food purchases, is at present directed almost entirely toward traditional foods. Animal protein foods are preferred by most consumers: demand is limited by price at the current consumer income/production cost equilibrium. Thus the main demand change in the last 50 years has been the shift of preference from grains and pulses to animal protein sources in the wealthier countries. Animal protein consumption has risen sharply in Japan, for example, reflecting expanding consumer income, while demand for traditional soy products has fallen. There are a few counter-trends: for example, the very high meat consumption levels in Argentina and, to a lesser extent, Australia have also fallen somewhat, with income/cost relationships probably the

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main factor. In the low-income countries, however, most consumers have a great desire for animal protein, but few can afford it.

In the choice among alternative foods, cost is undoubtedly the main factor determining demand. It is important even in the higher-income markets, and it remains at the forefront of any appraisal of alternative protein sources for the developing countries. The costs of widely consumed protein foods are compared in Table 1. They are based on 1970 or 1971 prices for average quality wholesale purchases in a major source of low cost supplies of each product. To allow, at least very roughly, for the value of the calories in each food these have been priced on a par with sugar, as a near pure calorie food in wide international demand, and deducted. It is understood, of course, that costs calculated in this way reflect other attributes of these foods as much as protein content: beefsteak is not eaten for protein alone. Furthermore, import duties and restrictions, transport costs, distribution margins and so on can radically change interproduct cost relationships in particular areas. Account should also be taken of the biological value of the protein which is generally higher in foods of animal origin. Subject to such reservations, it is striking how much lower in cost is protein from chick-peas, for example, than the protein in what are commonly regarded as protein foods.

Grains, the staple food in most countries, are also the main source of protein, furnishing almost half the total world supply. This proportion ranges from 70 percent in Pakistan to 17 percent in the United States. Pulses, oilseeds and nuts provide almost 13 percent

TABLE 1: RELATIVE COST OF PROTEIN IN MAJOR FOODS

	Price of product	Protein content	Price of protein ¹
	Cents per kg	Percent	Cents per kg
Chick-peas (India)	11	20	13
Wheat flour (Canada)	15	11	33
Beans (Mexico)	20	22	53
Skim milk powder (New Zealand)	33	36	68
Fish, dried (Norway)	55	37	141
Cheese (New Zealand)	77	25	266
Chicken (U.S.)	59	19	282
Pork (U.S.)	40	10	325
Eggs (Netherlands)	51	11	430
Beef (Australia)	75	15	478
Lamb (New Zealand)	70	12	535

¹ Net of calorie contribution valued pro rata with sugar at 8 cents per kg.

of the world's protein supplies. Their contribution is as high as 28 percent in Brazil and probably of the same order in China, 19 percent in Mexico and 18 percent in India, but in most countries much less. Fish accounts for only about 3 percent on a world basis but catches are growing rapidly. It is the main source of animal protein in countries such as Ceylon, Japan, Ghana, the Philippines, Portugal and Taiwan. Animal protein foods provide roughly 30 percent of the world's protein supply as against 70 percent from vegetable sources. Consumption of animal origin protein is closely linked with income—about 20 grams per capita in the developed countries as against 3 to 4 grams per capita in the developing world. Dried skim milk is the lowest priced animal protein and has an established market in India and elsewhere for reconstitution with local milk of high fat content.

Patterns of market demand can, of course, be modified considerably by government action. Milk was made available to the whole population of the United Kingdom during the second world war by government subsidy. While it is recognized that the developing countries generally lack the means to subsidize consumption of particular foods on any substantial scale, it is appropriate to ask how far they are pursuing policies directed toward securing the highest nutritional dietary levels within their limited means. Most of their governments recognize that malnutrition can prejudice social and economic development significantly through deleterious effects on public health and productivity. While in many cases committing themselves to traditional public health programs, including expenditure of hard currency upon imported drugs, often they find it difficult to implement other measures which would be helpful in reducing protein malnutrition. These include adjustment of agricultural plans and policies to favor food crops against those bringing immediate export earnings, and organizing supplementary distribution of protective foods to children in low-income groups.

Adequacy of Protein Distribution

Based on the new estimates of individual protein requirements established by the FAO/World Health Organization Expert Committee of April 1971, most countries with adequate calorie supplies appear to have more than enough protein on a national average per capita basis. However, incomes, food tradition, education and other factors lead to wide divergencies in protein intake within a given population. More protein food than is needed to cover average requirements must be available if all the population is to get enough. Food consumption surveys demonstrate that, during seasonal food shortages, not only do the number of families that are undernourished increase but the inequities in distribution become more acute. Per capita levels of consumption decline sig-

nificantly with rising sizes of family, so there is a high statistical probability that children in large families are undernourished. This is supported by specific information from surveys that the available food is very often distributed disproportionately among the various members of a family. The adults satisfy their needs at the expense of the children, who are inclined to eat more slowly. Yet, children's protein needs are proportionately greater than adults' because both maintenance and growth must be covered. Surveys carried out in Nigeria, Ghana, Central America, Colombia and a number of other countries showed that even where total family supplies were satisfactory children were receiving only 70 to 80 percent of their requirements; this is confirmed in more detail by a study of Indian household data. It is clear from the evidence available that the present distribution of proteins both among and within families is likely to lead to malnutrition in children rather than in adults. Bornstein and Morgan have shown how religious influences can militate against an adequate share of protein for women and small children, and how a figure for average meat consumption can be made up of lavish supplies at certain feast times and paucity for long periods in between.

The people who do not get enough protein usually receive inadequate diets as a whole. Thus, any program to improve the food situation of low-income groups would have to concentrate very largely on basic foods already in wide use, such as grains and pulses; much of their protein deficit would be met by the protein in such basic foods. Protein deficits appear to be most probable in the parts of Latin America where maize is the main element in the popular diet, in equatorial Africa where starchy foods predominate and in the rice-eating countries of southeast Asia. In the wheat-eating countries of the Mediterranean basin and the Near East and in the millet and sorghum-consuming zones of the African Savannah the calorie-protein balance is better. The cereals which constitute the largest part of the protein supply provide more protein for the same quantity of calories.

Projections to 1980

What changes in the protein supply/demand relationship can be expected from the continuance of present trends over the next decade? The FAO Agricultural Commodity Projections, 1970-1980 (1971) provides some dimensions (see Table 2). These projections refer to market demand only. They show that, assuming prices remain constant, per capita food demand in developing countries would grow by 8 percent over the 1970s, at an annual rate just under one percent. The number of calories per person per day implied by the projected demand would rise from 2,193 to 2,307, and the protein demand from 56.4 to 59.5 grams, in both cases an annual in-

TABLE 2: PER CAPITA DAILY FOOD REQUIREMENTS
AND LEVELS OF DEMAND IN 1980

	Per capita requirements ¹		Percentage of requirements			
			1970 consumption		1980 demand	
	Calories	Proteins ²	Calories	Proteins	Calories	Proteins
	Numbers per day	Grams per day				
World	2,385	38.7	101	173	105	178
High-income countries	2,560	39.5	121	229	123	237
Developed market countries	2,555	39.2	119	228	122	237
USSR and Eastern Europe	2,570	40.0	124	232	126	238
Developing countries	2,284	38.4	96	147	101	155
Asia and Far East	2,223	36.6	93	141	99	150
Africa	2,335	41.5	93	141	98	149
Latin America	2,383	37.7	106	172	110	179
Near East	2,456	45.5	97	147	101	153

¹ Revised standards.

² Expressed in local proteins.

crease of 0.5 percent. The satisfaction of these demands would thus mean a modest but definite rise in the quantity and quality of food intake on a national per capita average basis. However, the rise in per capita demand for animal proteins is likely to be much larger in high-income than in developing countries and the gap between the two groups of countries would widen.

There are areas—for example, in west and northwest Africa and in Asia—where national average demand for calories is projected to remain distinctly below the level of requirements. Because of the projected population increase of about 750 million people in the lower income countries by 1980, the absolute number of underfed people would not fall much over the 1970s. The extent of protein deficiency is hard to judge from these projections because they bear only indirectly on the distribution of protein foods within population groups.

Trade Movements of Food Protein

Per capita availabilities of protein foods in particular countries are substantially affected by international trade movements. Most of the existing international trade in protein-rich products is directed toward the developed countries, either from other developed countries and "semi-developed" countries like Argentina where

mainly animal products are exported, or from the developing countries which export specialty products such as frozen shrimps, and oilseeds, oilcake and fishmeal in bulk.

The developing countries are constrained by economic necessities to export such of their production as finds a more remunerative market in the developed countries. Little foreign exchange is available to pay for protein food movement in the opposite direction. In certain African countries and Brazil, for example, livestock and meat are exported from some zones while in others large segments of the population remain on very low protein diets because they cannot afford to buy more of the meat which is produced in their country. More than a hundred thousand tons of rice are exported annually from Nepal, yet in the mountain villages people are said to be starving. To divert exports to them the government has both to forego foreign exchange earnings and to provide subsidies that will bring down the price to a level the villagers can afford, which it can do only on a very small scale. Recently the government of Guatemala sensed criticism that beef was being exported from that country to the U.S. while a large part of the domestic population could hardly buy any because the price was too high. In an effort to remedy this, it set a lower price for beef by administrative edict. The result was a sharp drop in production because of lack of incentive to the farmer.

Another subject of nutritionally motivated criticism is the large-scale shipment of potential human protein food supplies such as oilseeds, oilcake, and fishmeal out of the developing countries to meet a steadily growing market demand in Europe, North America and Japan for livestock feed. In Peru, the fishing of anchoveta for processing into high-protein meal has grown remarkably in recent years. Attracting international investment and management, the industry emerged from obscurity to first place among the world's fishmeal producers in less than a decade and became the country's principal earner of foreign exchange. From many developing countries the bulk of such crops as coconuts, peanuts, soybeans and sesame seed has long been exported in the form of whole oilseeds or oilcakes. Even in those few countries where a significant amount of these crops is processed locally to meet the growing domestic demand for fats and oils, the protein-rich press cake is generally used as fertilizer, animal feed, or fuel, or even wasted altogether. Processing for human nutrition is feasible technically, but it awaits favorable economic conditions and the necessary initiatives.

Obstacles to Increased Protein Distribution Within Lower-Income Countries

An efficient marketing system must adapt the seasonal outflow of produce from the farm to a relatively stable and continuous demand

from consumers. This requires transport and storage facilities, skilled handling and processing, detailed knowledge of supply and demand conditions and sources, the provision of adequate credit, and willingness to accept risks and responsibilities. Limitations of capital, equipment, management and skilled operating staff all bear heavily on the capability of protein food distribution systems in the developing countries to serve lower-income consumers. Animal protein foods require fairly elaborate production and marketing systems if they are to be provided in large quantities and to maintain their quality through to the consumer. Transport is often a limiting factor in the distribution of food products and a major element in its cost. For example, a wholesale price of beef in Accra or Kinshasa of 32 U.S. cents per pound corresponds to 14 cents in Fort Lamy, Chad, since it must be brought over more than 600 miles from the savannah regions either as live animals driven on foot or as carcass by air. Many products containing the most valuable protein are highly perishable, and their marketing calls for special handling, treatment and storage arrangements, especially in tropical climates.

In developing countries fish are in fairly ample supply close to seas, rivers and lakes, but integrated large-scale organization of fishing and marketing is rare. Thus in western Africa fresh fish are plentiful up to a distance of about ten miles from the coast. Only in a few countries, such as Ghana, Ivory Coast and Liberia, has there been a full-scale attempt in recent years to develop a deep-sea fishing fleet, and the cold storage and distribution chain that would enable fish to become a major contributor of protein to the national diet. Dried fish are traded widely in Africa because of relative ease of handling, but losses due to insects and quality deterioration are considerable. These add substantially to the cost of the protein actually reaching the consumer and restrict distribution among lower-income groups. The long-standing absence of a marketing system for fish, either fresh or dried, lies behind the massive exports of fishmeal from Peru while large parts of its population remain on a low protein diet. Because there has been no system of bringing acceptable fish to the inland population, especially in the sierra, there is little familiarity with fish as a normal ingredient of the diet—except for salted sardines in limited quantity. Even when people from the sierra move to Lima and come within easy access of fresh fish at relatively low prices, their eating habits are slow to change. Comparable situations prevail in countries such as Egypt, India, Mexico and Pakistan, near areas where profitable industries exporting frozen shrimps and prawns have grown up in recent years.

Proteins of vegetable origin often require quite elaborate and costly processing, as, for instance, the fermentation and related

treatment of soybeans in east Asia and the washing of protein from wheat in India. Unfamiliarity with such processed products and the difficulty of fitting them into established eating habits and preferences, particularly of the lower-income groups, mean that intense promotional efforts will usually be needed. A decade ago many projects to market new protein-rich foods based on nutritional formulae were launched without adequate pretesting on a commercial basis and without much understanding of marketing and promotion. Now pretesting and promotion are here, but still most of the new products do not catch on. The incomes of the families which these products are intended to help leave little room for response to the promotional stimuli which build up a quick demand in more affluent consumer societies.

Measures to Improve Protein Food Distribution

There are various measures which governments can take to improve protein nutrition. Some such measures may be designed to raise overall purchasing power in lower-income groups. How far they are practicable, and the extent to which they are likely to achieve the objective of correcting maldistribution of nutritional food depend on the political complexion of the countries concerned and the funds available. Preliminary analyses of a number of Latin American countries indicate that a moderate change in income distribution there would result in a direct rise of some 9 to 9.5 percent in total food demand over 1970-80. A "drastic" change in income distribution (like that in Cuba, for example) would bring about an estimated 13 to 14 percent increase in demand.

Another approach for governments is to make it compulsory, for example, that a protein product be included in certain basic processed foods and in institutional diets, wherever such measures can be enforced. Individual consumers are unlikely to buy protein-fortified products selectively if they are going to cost more. Mass protein fortification in the developing countries would, of course, be greatly facilitated if there were a supplement which could be added to established basic foods without involving any significant price increase. This implies an ingredient cost of around 10 cents per kilogram in the case of wheat flour, and perhaps 15 cents for rice. On these terms, even the poorest government could introduce compulsory supplementation. Regrettably, some of our recent hopes for low-cost protein seem still very distant. This seems to be the case with fish protein concentrate (FPC) which, with present technology, still costs too much. According to a 1971 Tropical Products Institute survey, to compete on the world market FPC would have to be produced at an opportunity cost of only 33 cents per kilogram, but the lowest estimate for FPC production at the time was 55 cents per

kilogram. Comparative prices for other protein sources were soya flour (50 percent protein), 22 cents per kilogram; and skim milk powder (36 percent protein), 26 cents per kilogram. It also appears that petroleum-based protein suitable for human consumption will be more expensive than was first expected.

The marketing requirements to give the best chances of success for a new protein food in a free market are now well known. A detailed treatment was prepared for the United Nations Protein Advisory Group by B. Wickstrom. Such a food should have a competitive advantage in price, in some attribute such as quality, convenience, flavor or functional properties that is specifically recognized by the processor or consumer, and there must be effective presentation, distribution and promotion. If the protein-fortified product must inevitably cost more than the basic foods already available, then it should be offered for sale in the most attractive and palatable forms possible within existing economic limitations. It cannot be too strongly emphasized that protein by itself or protein concentrates are not consciously attractive products to the majority of consumers. Much more attention is needed on the flavor and texture of new protein products.

In the developing countries the introduction of a cheap packaged food must surmount inefficient distribution systems and high mark-ups, low, scattered consumer purchasing power and great attachment to traditional foods. The slow purchasing response to some oilseed protein products put onto the market in India, Nigeria and elsewhere, and the long gestation and high promotion outlay relative to retail sales of Pronutro in South Africa are evidence of the costs and risks to be faced. Because of the difficulty in obtaining commercial acceptance of new foods, something which can be incorporated into standard items of existing diets may offer the best immediate prospect of distribution in volume. The vehicle would be institutional meals, bread flours, chapatti and porridge mixes and so on, launched with publicity for its much higher food value and low cost. The initial success of "filled milk" (imported nonfat dry milk and domestic coconut oil) sales in the Philippines, which climbed from 1 to 43 million litres in four years, is attributed to its similarity to an established product and lower cost.

The trend toward greater consumption of processed foods and prepared meals, even in the developing countries, constitutes an opening for products such as soybeans and cottonseed which have adverse market connotations. Setting up a plant in a developing country where most of the ingredients are available locally solves the foreign exchange problem and would seem to offer the best prospects of sales to the population groups most needing additional protein. But while there have been a number of such ventures, it is difficult

to point to many that have taken root and flourished. Incaparina goes on in Central America and Colombia. In India the Tata Company is reported to be expanding its production from groundnuts of protein isolate for food uses from 2 to 6 tons per day. The Gujarat Agro-Industries Corporation is sponsoring a plant to process cottonseed for protein food use. Modern Bakeries is about to open new branches in several Indian cities. There are also some government-sponsored projects to launch protein foods for vulnerable groups in North African and Near Eastern countries. The weaning food FAFFA (wheat flour 57 percent, defatted soyflour 18, pea flour 10, sugar 8, defatted skim milk 5, salt 1, and additives 1) has been marketed now for several years in southwestern Ethiopia, where sales reached 700 tons over 1970-71. Superamine—using oilseed and chick-pea protein sources—went well initially in Algeria, but consumer demand has probably been overestimated. It has been commented that the substantial promotional investment, in the long run, helped competing products aimed at a higher-income market.

There is still a long way to go before the needs of the population groups presently suffering from a maldistribution of protein food are met. The scale of the problem calls for major inputs of capital, organizing ability and technical and promotional training. The need for specific marketing arrangements on both international and national levels to compensate for income inequalities and consumption preferences that are nutritionally perverse is likely to increase rather than diminish.

[Excerpted from "The Efficient Use of World Protein Supplies," Monthly Bulletin of Agricultural Economics and Statistics. Rome: Food and Agricultural Organization of the United Nations, Vol. 21 No. 6, June 1972, pp. 1-8.]

Meeting Nutritional Needs Through Commercial Channels

Bo Wickström

[The food consumed in developing countries, determined largely by family incomes, food supplies, and traditional preferences, is increasingly supplied through commercial channels. A "marketing approach" to the problem of improving nutrition will significantly aid in obtaining the acceptance of new improved foods, and in preventing the diversion of limited consumer incomes to non-nutritional expenditures.]

Through the years there has been an immense documentation of the relationship between income, price and demand, and it is usually found that the income elasticity for food is low (the proportion of income spent on food decreases as income increases), and that price elasticities vary with the kind of food. The latter is rather low for most basic foods, implying that a certain amount of food is bought regardless of price and that a price decrease usually does not lead to a corresponding increase in demand. If one knew price and income elasticities, it would be possible to state what would happen to the nutritional situation of consumers if income changed and what price policies would be needed to direct consumption in a proper way. Unfortunately, income and price are based on aggregate statistics of whole groups of consumers in the form of either cross-sectional or time-series studies. We lack detailed investigations on the reactions of single consumption units to various market variables, such as temporary changes in incomes or prices, migration, changes in family size, introduction of new products in the market or

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educational campaigns. Until we have this knowledge we cannot effectively undertake marketing measures.

The Distribution of Purchasing Power

When describing the economic status of consumers in a country the national income per capita is usually given. However, this income level is not reached by a majority of the consumers. To obtain a proper idea of the general status of purchasing power, one must use income distribution figures. Empirical data show that the distribution of purchasing power is quite skewed in most countries. As an example, a survey of household expenditure data in Tunisia for 1964/65 showed that half of the population accounted for only about 20 percent of the total household expenditure. The average yearly per capita expenditure was about 71 dinars (approximately \$140), but some 70 percent of the population had a per capita expenditure below 70 dinars. In India, according to the National Sample Survey 1963/64, the estimate of monthly total consumer expenditure per capita in rural areas was about 22 rupees (approximately \$3), but about 60 percent of all households had a per capita expenditure below 21 rupees and about 25 percent a per capita expenditure below 13 rupees. Although expenditure patterns vary with income, geographical and climatic conditions, cultural traditions, etc., a major part of income is spent on food in most low-income countries. The consumption is usually concentrated on a few staples, often of the starchy type. For example, in India as a whole, 70 percent of expenditure in rural areas and 60 percent in urban areas was for food. The cereal component of the food was rather high, some 55 percent in the rural and 37 percent in the urban sector.

The importance of food raised by subsistence farmers for their own use varies with agricultural practice. Common products for such consumption are milk, eggs, cereals, fruits and legumes. With urbanization, this source of nutrition declines or disappears altogether, and households become totally dependent upon the commercial distribution system for their food supply. This might easily lead to a decline in nutritional status. Urbanization and increased incomes can often lead to higher consumption of imported foods.

Income as a Determinant of Nutritional Status

With rising incomes consumers can spend more money on food and on better quality food. As can be seen from Figure 1, consumers with low expenditure levels have a low per capita calorie intake, which goes up very quickly with income and then levels off or even declines. At the very low levels, calorie consumption elasticity is high and a small increase in income produces a more than

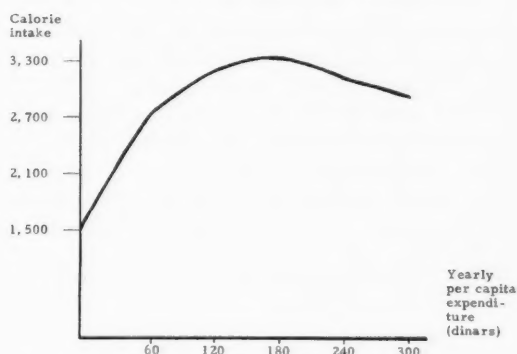
proportional increase in calorie consumption. At an expenditure level of over 40 dinars the elasticity will become lower and an income increase will produce a less than proportional increase in calorie consumption. Similar curves can be constructed for various types of foods, for protein intake and so on.

It is especially important to find out the existing calorie and protein deficiencies among consumers and to what extent these can be related to income. That there is such a relationship can, for example, be seen in the data from Tunisia, which show that 48 percent of the households with a per capita expenditure below 30 dinars (\$60) per year had a per capita intake of less than the recommended level of 2,000 calories and 36 percent of the same households were deficient in protein intake (less than 55 grams per day). Corresponding figures for households with a per capita expenditure surpassing 100 dinars (\$200) per year were 2 percent and 4 percent. Depending on food habits and child feeding practices, such deficiencies will be more or less severe for the children.

The Commercial Distribution System as a Vehicle for Improved Nutrition

In many countries in Africa and Asia agriculture is the dominant occupation and much of what is produced never enters the market but is consumed on the farm. In these subsistence economies commercial distribution is of minor importance although it is the main source of supply for urban consumers and for cash-crop farmers. In all economies, however, there is some kind of trading, if only for salt, oil and spices in the open marketplace, and the households come into more or less frequent contact with different types of vendors. With improved transportation and information, and with increasing per capita farm output, the commercial distribution system will increase in significance to consumers. For many countries the distribution system already determines nutritional intake, as products and their prices are matched with consumer purchasing power. The commercial distribution is often passive and traders have neither the scope nor the experience to introduce new packaged and branded consumer products. To this should be added the difficulties in continuously reaching outlying consumer areas because of poor roads and insufficient transportation capacity.

FIGURE 1. RELATIONSHIP BETWEEN PER CAPITA EXPENDITURE LEVEL AND CALORIE INTAKE IN TUNISIA



Source: Institut National de la Statistique, 1970.

Granted a given purchasing power and given prices, what can be done through the commercial system? There are two main strategies: a) education and information; or b) new product programs. On the surface it seems quite simple and logical to change the family's food habits through various informational and educational means, and to teach families to grow some nutritious foods in their own back yard or buy cheap staple foods within their economic reach and mix them according to some predetermined recipe into foods suitable for children. In practice, however, there are resistances to such changes. The other strategy, which has also been tried with varying amounts of success, involves the production of a special low-cost children's food (for example, a protein-rich supplementary food) and its distribution through commercial channels to the consumers.

Modern marketing methods could be of assistance in solving some of the nutritional problems in traditional societies by helping the consumers use their purchasing power in a more efficient way and by making the channels of distribution more effective. As was mentioned, this could be partially accomplished by the introduction of low-priced nutritious products for children. In doing this the contribution from modern marketing, designated the "marketing concept," could be to introduce a new frame of mind, to look at the nutrition problems from the consumers' point of view in a total systems approach, and to adapt products, packages, brands, prices and messages to the needs and psychology of the consumers with the help of accepted marketing techniques. There are many cases where sins have been committed against these very basic rules. "Production-oriented" approaches have been used instead, and here the main interest has focused on developing production techniques and product concepts unrelated to the consumers' basic beliefs.

If commercial channels are to be used at all in solving nutritional problems, especially of children, all the weapons in the arsenal of the commercial marketing man must be used: 1) definition of goal variables (net nutritional changes, trial rates, repeater rates, market coverage, purchase and consumption frequency, etc.); 2) definition of target groups; 3) differentiation of approaches according to market segments; 4) establishment of proper marketing mix (price, package, information, personal selling, etc.); 5) choice of proper distribution channels; and 6) establishment of systems for market feedback information.

In many new food programs it seems that purchasing power is the main limiting factor, and despite all efforts to establish excellent marketing programs, the desired nutritional effects are not attained. The production volume may be sold, but it does not reach the children in the target groups in such a way that nutritional improvement results. Since nutritional deficiency accompanies low purchasing

power, the consumers who need the new products cannot afford them or cannot afford them in prescribed quantities, while the consumers who can afford them may not need them. Therefore, careful calculations of the relationship between total outlay for a new food and total yearly purchasing power of the target group must be undertaken before a new children's food is launched in full scale, and the necessary consequences in the form of price subsidies, etc. are considered. If this is not done the whole program may become a total waste and there may even be adverse consumption effects. An information system also has to be established to continuously follow purchasing and consumption.

The Need for Commercially-Distributed Nutritious Foods

As development proceeds in Asia and Africa, a much stronger struggle for space in the consumer's budget can probably be expected from the manufacturers of processed goods, both foods and non-foods. The trend will mean an increasing number of manufactured products in the markets and more aggressive marketing tactics used by both domestic and foreign companies. With an increasing assortment of goods placed at his disposal, the consumer will then be tempted to reallocate his budget to obtain some of these new products, be they detergents or cosmetics, plastic containers, cigarettes, soft drinks or beer, transistor radios, ready-made garments, or, of course, high-priced, sophisticated baby foods. For some consumers, increasing purchasing power will allow for a more diversified consumption; for others there will only be more goods in the market to tempt them to use their money in new ways by cutting down on previously consumed items. As in industrialized countries, some of the money for the new products may come from savings on the food bill. This could then result in a deterioration of the nutritional situation; in some cases, even in spite of improved purchasing power.

If in the future there is no "cross fire" from the makers of processed nutritious foods in the battle for the consumers' money, the food proportion may lose out. When and if this will happen is difficult to predict. One thing is certain, however; society in the developing world is moving towards greater commercialization, and national and multinational companies selling consumer goods will develop more efficient and advanced marketing techniques. Psychological factors may play a greater role in the consumption decision, and newly-developed products may be bought for status value rather than for their inherent qualitative properties. It will become increasingly difficult to change consumption and food habits through educational campaigns alone, since the alternatives competing for the consumers' money will multiply. Against this back-

ground it is evident that in the future the supply of commercially-distributed, low-cost nutritious foods must be stressed even more in order to maintain and improve the nutritional status of consumers.

[Excerpted from "Purchasing Power of African and Asian Consumers in Relation to Meeting the Nutritional Needs of the Child Through Commercial Channels," PAG Bulletin. New York, N. Y.: Protein Advisory Group of the United Nations System, Vol. II, No. 4, Fall 1972, pp. 16-23.]

Lessons from the Indian Experiment

Alan Berg

[Much of the most interesting nutrition thinking and experimentation is going on in India, where substantial steps have been taken to build a national nutrition policy, to launch a national program, and to establish projects—both operational and experimental. This is not to suggest that India's nutrition problems have been solved or are even well on the way to solution, but an encouraging beginning has been made.]

For the past half century, India's laboratory and clinical work in nutrition has ranked with the finest in Asia. As in most nations, however, the linkages between the scientific community and the government and political policy makers have been few. Laboratory findings have often remained in the laboratory. Until recently, the policy maker saw malnutrition as a welfare problem and addressed it accordingly. It took the Bihar famine of 1966/67 to dramatize the magnitude and implications of malnutrition. Ninety million people in eastern India were trapped in the worst drought since the country became independent. Pictures of bloated bellies appeared regularly in the world press, accompanied by predictions of a vast natural disaster involving millions of starvation deaths. Fortunately, the forecasts proved to be wrong. The Indian government mobilized a massive relief program and, aided by substantial quantities of food from the international community, was able

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to hold the line until the next monsoon. The experience made a deep impression on the Indian officials who participated in the relief effort.

During the same period, government officials began to be concerned by findings reaching India that suggested a link between malnutrition and mental development. They already knew that malnutrition was the major cause of childhood deaths. They were also aware that poor food affected bodily growth and thus physical performance. However, for the first time they began to see a connection between nutritional deprivation and the sluggishness commonly observed among the extremely poor. When the head of the national nutrition research laboratory reported that 80 percent of India's children suffered from "malnutritional dwarfism," some Indian political leaders publicly expressed fear that India might be raising a generation of substandard citizens.

Agricultural Production

One response to the famine crisis was an accelerated effort by the government to raise grain production. Successful introduction of new, high-yielding seed varieties, combined with widespread use of fertilizer and modern agricultural methods, led to rapid increases



ABOVE: Farmer examines high-yielding wheat developed by Punjab Agricultural University. [Photo: U.S. Agency for International Development]

in production. In the two years following the famine, acreage planted in high-yielding varieties increased five-fold. Fertilizer consumption more than doubled and, perhaps of greater significance, so did local production of fertilizer. In one year the total number of tractors increased from 51,000 to 81,000 and, half of the new tractors were locally produced; foodgrain production reached 95 million tons compared to 72 million tons in the famine year and a previous high of 88 million tons. By 1971, India was producing 106 million tons of cereal grains, in the process building a buffer stock. Even with widespread drought and a war in the following year, preliminary 1972 crop estimates were close to 100 million tons.

Although all this was of obvious benefit to the well-being of the population, it was no assurance that the

additional food or the income generated by the crop increases would be broadly distributed. In fact, to some it seemed likely that if the agricultural revolution continued along its path of the late 1960s, the already difficult income distribution problem and its related tensions would be further aggravated.

Program Approaches

To Indian policy makers and administrators who turned their attention to nutrition it was apparent that many highly nutritious foods—natural and processed—were beyond the reach of all but the very affluent. This was especially true of foods for very young children. Experience had demonstrated the difficulty of altering established and preferred food habits. If diets could be improved inexpensively without requiring conscious decisions by consumers to buy, cook, or eat differently, the likelihood of success was greater.

Fortification innovations. Early in the new effort, attention focused on using established foods as carriers of additional nutrients. The first large venture into fortification of cereal foods came with the introduction of Modern Bread in January 1968. During the drought years of the mid-1960s, the Food Ministry had made a concerted effort to increase bread consumption since wheat, unlike rice, was available in large quantities from abroad. With help from Australia and Canada the government established nine Modern Bakeries plants, capable of producing 100 million loaves of bread a year, in the major cities of India. To each loaf was added the synthetic form of the amino acid lysine, to increase the bread's protein value, plus vitamins and minerals tailored to India's major nutritional maladies.

Early skepticism that only the urban wealthy were bread eaters and would benefit proved to be wrong. In Bombay, 40.6 percent of those with family incomes under \$26 per month in 1969 were daily bread consumers. In Calcutta, 29 percent of two-to-four-year-olds ate bread. Also, bread increasingly reached into non-urban areas. In 1970, 40 percent of all bakery products were consumed in rural areas, only half the amount consumed being baked there. Although bread is not yet a major item in the general Indian diet, commercial bread production is expanding rapidly—by 250 percent in the 1960s. The influence of Modern Bread on increased production is difficult to measure, but it is interesting that most of the major bread producers emulated Modern by introducing fortification into their products and by stressing better nutrition in their advertising.

More important than bread sales was Modern Bread's success in dramatizing the possibilities of fortification. In 1969 Secretary

of Food A. L. Dias announced that India had adopted a policy of fortification, soon reflected in a large-scale project designed to fortify a traditional Indian food, atta, the ground wheat product popularly used to make the dietary staple, chapatti. Premilled atta, the least expensive form, is often bought by those in the lowest economic group. Beginning in 1970, premilled atta sold in Bombay and Calcutta incorporated sizable doses of vitamins and minerals, and protein in the form of groundnut flour.

Although it reaches the bottom of the income ladder, fortified atta benefits mainly the urban population. Nearly 80 percent of Indians live in rural areas, where it is logistically impossible to undertake a wheat fortification program because most of the wheat eating portion of the country's 565,000 villages have their own grinding equipment. As a result, a search was made to identify low-cost, centrally processed foods that already reached all elements of the population.

The most attractive item meeting these criteria was salt, already used in some areas as a carrier of iodine to combat goiter. Salt is universally used—those not part of the monetized economy barter for it. And salt production is relatively centralized—the annual Indian production of 4.8 million tons is limited to fewer than 200 salt works (roughly half of it in 24 large works, most of which are located in Gujarat). Distribution of salt can be at least partially controlled by the central salt department and by the regulatory mechanisms of the state governments. Nutritionally, salt is an attractive carrier because it is used consistently throughout the year, an important consideration given the seasonal variation of the rural Indian's diet. Most important, salt is consumed in relatively constant quantities by all Indians, urban and rural, vegetarian and non-vegetarian, rich and poor. Those in need of the greatest nutritional help, in fact, may be the heaviest consumers—it is often the only flavoring agent they can afford. The vast majority of Indian women and small children suffer from nutritional anemia. Salt with iron added could reduce this condition significantly at a cost of about \$4 million a year, or a 10 percent increase over current costs. Calcium can be added to salt without increasing the cost. Iron and calcium fortified salt have been successfully tested in the laboratory and clinic, and incorporation of other nutrients is being examined.

Research also has begun on the fortification of tea. Contrary to common belief that tea was almost solely an adult drink, surveys completed in 1970 and 1972 showed that in some states tea was given regularly to 78 percent of the "under five" population. And unlike nearly all other food products, it was consumed in quantity by rich and poor in both rural and urban areas (in Calcutta, for example,

93 percent of both the highest and lowest income groups surveyed take tea regularly). In Gujarat, 87 percent of villagers gave tea to their children, including 84 percent of the lowest income group (family incomes of under \$13 per month). A study covering all of India found that 54 percent of tea drinking families gave tea to their children. Moreover, per capita tea consumption is increasing dramatically, averaging a 6 percent increase annually from 1956 to 1968.

Interest in tea fortification stemmed partly from the discouraging findings of an investigation into the possibility of fortifying rice. Because the vast majority of Indian rice eaters cooked their rice in large quantities of water, which was then discarded, any fortifying elements would probably disappear also. In the case of tea, it was the residue itself that was consumed. Professional tea tasters in Calcutta and London tested Indian fortified tea without detecting a difference in the character of the product. Investigation of the value of fortified tea—particularly as a carrier of vitamin A—is in the early stages.

Another unsuspected fortification vehicle was discovered from a survey undertaken in Calcutta to identify child feeding practices. Low-income families, it was learned, commonly used sago, a low-nutrient product made from small globules of tapioca, as a weaning food (children under 12 months of age averaged 1.2 servings a day). Moreover, 80 percent of all sago was produced in one town in Tamil Nadu, simplifying control. Thus, sago was an excellent prospect for carrying nutrients to a target group. The same survey pointed as well to a popped rice known as muri that is consumed by substantial numbers of low-income Bengali children. These fortification examples are not put forth as panaceas or as projects necessarily worth emulating elsewhere, but rather as conceptual approaches that may have broader applicability.

Initiative of the private sector. A second feature of the Indian experiment was the role of private enterprise. In contrast with most other developing countries, India has sizable and sophisticated food processing and pharmaceutical industries. Yet it was only after the Bihar famine, in mid-1967, that a group of business leaders met to evaluate industry's responsibility and commercial opportunities in meeting the country's nutrition needs. The group has grown into an organization of 32 firms and three government institutes—known as the Protein Foods Association of India—designed to do collectively what few single firms can afford to do alone.

One of its prime objectives is to make reliable market data available to manufacturers. Thus a series of regional food habits

surveys was its first large project. Little was known of what people ate (by income, cultural group, and community size), why and how it was prepared, and how it was distributed within the family. The western regional study pinpointed several foods popular with the lowest economic classes that might be improved through fortification or genetic development of seeds (for example, while most of the attention devoted to upgrading the protein level of seeds had focused on wheat and rice, the survey indicated that the people who need help most eat sorghum and millet). Similarly, specific widely consumed condiments emerged as potential carriers of better nutrition to the lower classes.

To create greater public awareness of the nutrition problem and keener receptivity to new foods being developed by individual firms, the industry group launched an institutional advertising campaign. It involved all mass media—including a film released to 3,500 cinema houses throughout the country—and leaned on the national penchant for astrology: "Your child's plate is his horoscope." The aim of these activities was to accelerate the introduction of a series of nutritious foods onto the market. By 1972, 27 new beneficial products were under development, being market tested, or being sold. The government's response to the interest and initiatives of industry was positive, if belated. Throughout 1969 a joint government-industry committee conducted hearings into problems of the food processing companies with an eye toward meeting industry needs for food standards, more flexible licensing procedures, and possible incentives.

Redirecting child feeding programs. A third element of India's nutrition effort was the school and preschool child feeding program. Sizable numbers of children were reached for the first time during the Bihar famine, and the visible effect of the feeding on the youngsters was dramatic. In the late 1960s nearly 17 million Indian children received a regular meal under the program. The meals often included Bal Ahar, the low-cost, locally produced blend of donated American wheat and inexpensive Indian oilseed protein. After a stumbling start, production had increased to 55 million pounds in 1971, and prospects for still further widespread use of the cereal blend appeared favorable.

Institutional feeding programs were believed to have an effect on learning ability and classroom performance. The child with an empty stomach, it was sensed, was neither alert nor receptive. Nor was he physically or mentally equipped for the rigors of formal education. (The extensive evaluation of institutional child feeding programs known as the Orissa study was undertaken from 1967 to 1970 to learn more precisely what the effects were.) At one point the president of the ruling Congress party raised the issue of nutrition and educational performance with a group of officials who had a major

role in India's economic policy. After learning from them that some \$300 million a year was spent for primary education, the Congress president asked whether it would not be better to spend a portion of these funds to equip the child nutritionally to cope with the school experience.

New concepts in nutrition education. The Indian experiment also attacked the problem of nutrition education. Better use of the existing family food budget via better consumer understanding had long been recognized as important to nutritional improvement. Nowhere, however, had experience in bringing this about been encouraging. Both the effectiveness and economics of the traditional extension approach to nutrition education were open to question.

The new approach in India has isolated the problem as not so much one of nutrition as of communication. Mass media and commercial advertising agencies were brought into education campaigns. They made a conscious effort to avoid the earnest "four food groups" clichés of the standard nutrition posters and to introduce instead ap-



ABOVE: Mobile kitchens bring nutrition education to villages. [Photo: Food and Agriculture Organization of the United Nations]

peals playing on universal values. The initial advertising for Modern Bread, which featured health and the addition of lysine, was withdrawn in favor of what turned out to be a highly successful campaign built around other appeals; after consumer interest was awakened, the nutrition theme was reintroduced, with some success. Vanaspati, a vitamin fortified oilseed-based fat used in place of the more costly, traditional ghee, saw greatly increased sales with the shift from a straight nutritional to a "mothers who care" campaign.

The emotional play on universally expressed human needs, such as survival and the minimization of suffering—including suffering due to loss of child—proved to be an effective way of reaching consumers. Another valuable aid in designing campaigns was recognition of basic societal influences. A mass media advertisement, for instance, was based on the popular Tamil proverb "Does your child eat with his mouth closed what you feed him with your eyes shut?" The dominant saffron-orange color used for promotional materials and product packages for Bal Amul and Modern Bread reflects demonstrated Indian preference for the color, perhaps due to the positive identification of the color with the saffron robes of the sadhus (holy men).

Adventure comic books with a nutrition message were distributed to millions of children who never before had been exposed to this medium. Market research techniques were employed to learn what people eat, why they eat it, and what they regard as good for them. Studies showed a higher understanding of how food affects health than expected—but often a misunderstanding of the benefits of specific foods. Special efforts were made to reach people where they regularly congregate. The government produced ten movie shorts on nutrition to reach the millions of ardent Indian film goers, and instruction for dietary improvement was transmitted by All-India Radio through both community and private receivers.

Analytical approach to solving nutrition problems. Perhaps for the international nutrition community the most significant innovation in the Indian program was the employment of development planning techniques to solve nutrition problems. The first attempt to evaluate alternate cost solutions was a comprehensive nutrition plan presented by the Ministry of Health in 1968 [described in Development Digest of January 1969, pp. 28-31]. Although it was not so sophisticated as some analysts would desire, the plan successfully initiated the use of analytical techniques to determine a policy for meeting nutrition needs. A much broader systems approach was started in 1970 in the southernmost state of Tamil Nadu.

Other activities also were being pursued, with varying degrees of success. Indian scientists pushed ahead with research to develop

higher protein seed varieties. The government undertook a \$140 million program designed to improve the quality and quantity of urban milk supplies. Cottonseed, historically used for animal feed, was processed experimentally for human consumption. Cultivation of soybeans, high in protein but virtually unknown in India until the mid-1960s, was introduced, with per acre yields rivaling those of experimental stations in the United States. A milk substitute to be used with tea—the way most Indian milk is consumed—was successfully developed from oilseeds. As in several other countries, research was initiated on fish protein concentrate and on single cell protein. By 1972, plans were well under way to implement a massive integrated child welfare program featuring nutrition feeding of small children and pregnant and nursing women, education of the mothers, special prophylactic measures against nutritional anemia and blindness, immunization, preschool education and health care.

Attempting to pull together the multiplicity of activities was an inter-ministerial committee at cabinet secretary level, chaired by the Planning Commission. This group in 1969 helped develop the nutrition chapter of India's Fourth Five Year Plan. Eighty million dollars was budgeted for a nutrition program in the plan; several times that amount was being considered for the Fifth Plan.

Lessons Learned

From the Indian experience, certain principles of nutrition programming and planning have developed that deserve highlighting.

1. Most significant is the scale of thinking about nutrition. The necessity of working within the confines of overstressed health ministry budgets has kept nutrition experts in many countries from facing up to the magnitude of both the challenge and the opportunity and thus from taking the kind of quantum jump planned in India. There are officials in New Delhi working on the premise that a massive attack of malnutrition could nearly eradicate certain nutritional diseases. This is a scale of thinking perhaps never before envisioned for nutrition.

2. An important bureaucratic principle emerged from the Indian experiment: if the existing framework doesn't work, don't work within the existing framework. Too often, as at the start in India, attempts are made to fit a new far-reaching program into established institutions. But frequently the mode of operation of traditional ministries and research institutions is not conducive to new concepts and experimentation. To escape the bureaucratic quicksand, the Indian officials instead of tailoring their needs to existing institutions developed new organizational arrangements. In the process, a num-

ber of existing organizations (though not always their field services) were infected with a nutritional commitment that led to productive contributions to new programs.

3. A common question in the development business is whether a new concept or program can best be introduced at the base working level of the bureaucracy, with the aim of projecting a technically well-supported project upward in the hierarchy, or started at the very top so that its effects can trickle down. In the limited experience in India neither answer was correct. Both routes were tried. The technical forces, although often highly qualified professionally, did not carry sufficient influence to move the bureaucracy. The ministerial level, although attracted to the political value of a nutrition concept, was often so preoccupied it could give no more than fleeting attention to a problem. What worked for India was the effort of a small, informal, unorganized constellation of enlightened businessmen and scientists, a devoted newspaper editor, and—most important—senior civil servants. These interested men never met as a group, and in some cases were not personally acquainted with one another. They were conscious, however, of their mutually reinforcing roles; their interactions were responsible for the critical steps leading to a formal national policy and heavily budgeted program.

4. Recognition that programs do not develop according to a predetermined master plan has brought flexibility to nutrition operations. Although ultimate objectives must be clear, opportunities—often unexpected—must be seized and parlayed as they arise. For example, early nutrition efforts in India were sidetracked because of the Bihar famine, but the widespread public concern aroused by the famine gave the impetus that otherwise might have been missing for development of a child's food.

5. The Indian nutrition effort forced attention to a sophisticated application of new technology, both scientific and managerial. In developing societies, the transfer of complex modern technology that might bring leapfrog advances is often talked about and rarely applied. The need to find substitutes for foods that richer nations already consider inexpensive—and to find ways to bypass stubborn traditional food habits—has forced India to begin applying the new nutrition technology. Much of its nutritional progress may be attributed to India's willingness to explore and experiment beyond conventional boundaries—notwithstanding the doubts of scientists and bureaucrats, both Indian and international. Had Indian government programmers heeded the well-intentioned critics of such concepts as bread fortification, salt fortification, and the formation of an industrywide action group, the nutrition momentum might never have developed.

6. One result of the new style of programming was recognition of the need for a more systematic look at ways to improve a child's nutritional well-being. Over the years many solutions have been advocated. A set solution is easy to sell; it is specific; its costs can be detailed; its effects are presumably measurable. This, however, may be looking through the wrong end of the telescope. Rather than starting by examining specific food or fortification possibilities, India began to examine what a child eats, how it gets to him, and where in the delivery system intervention is feasible and most helpful. A slight twist of the market mechanism may mean more to the nutrition of a child than all the new foods that could be devised and produced. A shift in production incentives, retail price policies, or ration shop procedures could well be a major part of the answer. Initiatives in Indian nutrition planning began to take such factors into consideration. In carrying out its intent, India undertook several significant planning and evaluation projects. They were not allowed, however, to hold up existing nutrition activities—or to hinder new ones based on current best judgments.

7. The success or failure of nutrition projects, it was quickly recognized, often hinged on factors that seemingly had nothing to do with nutrition. Thus the practical considerations included the political attractiveness of a project, its visibility, the length of time required to see results, the potential reaction of commodity interest groups, prospects for imitation, long-range effects, managerial competence, clearance requirements, administrative constraints, and so on.

Modern Bread was selected as the first fortification venture in India partly because it was easy, quick, inexpensive and visible and required the involvement of relatively few people. Plainly, there were more important ways to improve Indian nutrition—one of them to grow more pulses. But this implies changes in land use and, as such, risks controversy. It was quickly apparent that many officials would be involved—formally and informally—in any decision to change agricultural objectives. And it was evident that non-nutrition considerations—both relevant and reasonable—would weigh heavily on their attitudes. By contrast, a new policy to fortify Modern Bread meant concurrence of Modern Bakeries' chairman (who was also the secretary of food) and its managing director. Those attempting to improve nutrition in India opted for reality. There was no illusion that fortification of bread would solve India's nutrition problems—they chose to do the doable. In short, there is an important psychological dimension to development, and there is nothing more effective in creating momentum than a successful start. This may mean expending energies initially on projects selected for high visibility, short gestation times and a high prob-

ability of success. A project shaped by these criteria may produce less direct payoff than longer term alternatives, but it may be the best means of attaining the ultimate nutrition goal.

8. At a certain stage, nutrition problems move away from the domain of technology toward the domain of administration. Patient research and experimentation by the scientific community obviously are critical. However, the programming of operational elements, often overlooked in the past, proved to be an essential component of India's program. The biggest difficulties, once research is completed, involve budgeting, managerial, logistical and marketing problems. Solving them requires different talents, different temperaments, different skills—often a combination of skills that straddle the traditional disciplines.

9. One administrative feature almost always included in India's program activities was operational evaluation. An experiment, by definition, will include failures. Too often in the development business, however, no objective measurement is made of how programs are working; or an academic evaluation is made that is not helpful in programming and decision making. The research element that was part of nearly all the Indian nutrition activities forced attention to the life styles and needs of specific age, income and geographic segments of the population. As a result, officials began abandoning the misleading averages and aggregates that commonly had been used.

Examination of program effects has led to a belief that further expansion hinges not so much on answers to medical questions as on answers to social questions. Nutrition needs have created issues of income distribution, resource allocation and the nutritional implications of agricultural policy. A few government leaders have begun thinking of nutrition in terms of the productivity of the properly nourished man, the contribution of the child with full mental and physical capacities, the waste of bearing and rearing children destined for early death or for a lifetime of curtailed productivity, the social harms inflicted by malnutrition, and the positive effects of better nutrition on family planning.

10. The Indian nutrition experience reflects a fruitful style of technical cooperation, one that offers an illustration of a direct problem-solving approach, with all the broadness of operational scope this implies. Indian specialists, and their foreign counterparts, pursued problems that cut across the usual functional sectors—and across departmental organization charts—of development programming.

Nutrition and Politics

The Indian experience pointed up the potential attractiveness of nutrition as a political issue. Although politicians realized that no single factor could meet the minimum aspirations of the poor, they began to see that better nutrition might play an important, relatively fast-acting, and highly visible role, and to some extent was within the means of India to provide. Recognition of nutrition's vote-getting appeal, however, was slow in coming. The prominent exception among the political leadership was C. Subramaniam, minister of food and agriculture in the mid-1960s, acting president of the new wing of the Congress party after the split in 1968, minister of planning in 1971-72, and, throughout, a close adviser to Prime Minister Indira Gandhi. A panel he headed laid out a credo for the departing faction of the Congress party. It called for a Socialist Charter for Children, noting that "the majority of our children do not have the benefit of a balanced diet. . . we are producing a generation of intellectually and physically stunted growth. Any talk of equality of opportunity for individuals in [such] a society has no meaning. . . due to malnutrition." The theme was incorporated in the party's 1969 platform, which called for a guaranteed minimum diet for 80 million preschool-aged children. A suggested one percent national levy on all taxes to raise the necessary revenues for the program was heralded in the press.

Beginning steps were taken to implement the "Children's Charter" in 1970. Better nutrition became one of the major themes of the following year's campaign and an important plank in the Congress Party Manifesto. In her successful 1971 election campaign Mrs. Gandhi hammered away at themes she had enunciated earlier; "Just as economic strength is the true basis of national strength, adequate nutrition is essential for the individual personality to unfold. Without attention to nutrition, we shall be denying large sections of our people an opportunity to help themselves and to make their contribution to the country."

What began as an experiment now forms the beginning of a national program—and is being looked on as a prototype by other nations. The Indian experience is significant for its scientific achievements and applications of technology. Perhaps more important are the underlying reasons the nutrition programs were taken up and the innovative approaches employed in implementing them. Their adoption reflects serious thought devoted to the developmental ramifications of malnutrition, to the economic dimensions of the problem, to the distribution of benefits of such programs, to the vote-getting appeal of nutrition in a democracy, and to multi-sectional nutrition planning.

India's nutrition problems are by no means under control. The gains against them are significant—and cumulative—but must not be magnified out of proportion. Not all of the recently devised activities can be expected to evolve into viable projects; by definition, many were experiments. Also, the need is of such magnitude that even the best of government intentions may fall short. Massive logistical and cultural barriers stand in the way of reaching the neediest elements in the society. However, the possibility of reaching the targets of need has been strengthened by India's recent experience. The country's leaders recognize the problem and are committed to doing something about it. Although implementation of the commitment still poses many questions, a promising start has been made.

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DEVELOPMENT MEASURES

POVERTY PERSISTS DESPITE GNP GROWTH.
[PHOTO: FOOD AND AGRICULTURE
ORGANIZATION OF THE UNITED NATIONS

What Are We Trying To Measure?

Dudley Seers

[Development means creating the conditions for the realization of human personality, and this cannot be measured by national income figures. Its evaluation must take into account three linked economic criteria—whether there has been a reduction in (i) poverty; (ii) unemployment; (iii) inequality. Conceptual and practical problems of using these three indicators are discussed.]

Why do we confuse development with economic growth? Surely one cannot say that the situation depicted by one set of values was preferable to that shown by another set simply because the former implied higher per capita income. After all, in what sense is South Africa more developed than Ghana, or Kuwait than the U. A. R., or the United States than Sweden? One explanation is that the national income is a very convenient indicator. Politicians find a single comprehensive measure useful. Economists are provided with a variable which can be quantified, and movements in which can be analyzed into changes in sectoral output, factor shares or categories of expenditure, making model-building feasible. We might suppose that increases in national income, if they are sufficiently fast, sooner or later lead to the solution of social and political problems. But the experience of the past decade makes this belief look rather naive. Social crises and political upheavals have emerged in countries at all levels of income, afflicting countries with rapidly rising per capita incomes as well as those with stagnant economies. This continued addiction to the use of a single aggregative indicator begins to look like a preference for avoiding the real problems of development.

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If overall income growth is an inadequate answer to the challenges we now face, we have to look again at the word development and decide more precisely what we should mean by it. The starting-point is that we cannot avoid value judgments. Development is inevitably a normative concept, almost a synonym for improvement. To pretend otherwise is just to hide one's value judgments. But from where are these judgments to come? The conventional answer, which Tinbergen accepts for his system of economic planning, is to draw our values from governments. But governments have necessarily a rather short-term view, in some cases discounting the future at a very high rate. Some governments are themselves the main obstacles to development by any plausible definition. Even supposing that governments represented popular attitudes, the changes in these attitudes are a part of the development process and therefore cannot provide a means of assessing it. Another approach is to copy the development paths of industrial countries. Yet few of the rich countries now appear to the outside world as desirable models in all respects. Their consumption levels seem enviable, but these are associated with other qualities that are not universally approved. Besides, it is by no means obvious or even likely that the rest of the world could retrace the history of the industrial countries if they wanted to.

Does this mean that we are each left to adopt our own personal set of values? This is not necessary. At least some of the values we need to define goals for development are staring us in the face as soon as we ask ourselves: what are the necessary conditions for a universally acceptable aim, the realization of the potential of human personality?

If we ask what is an absolute necessity for this, one answer is obvious—enough food. Below certain levels of nutrition, a man lacks not merely bodily energy and good health but even interest in much besides food. Recent research shows that if young children are not properly nourished the result may well be lasting impairment, not merely of the body but also of the mind. Since foodstuffs have prices, in any country the criterion can be expressed in terms of income levels. This enables it to take account also of certain other minimum requirements. People never spend all their money (or energy) on food, however poor they are. To be enough to feed a man, his income has also to cover basic needs of clothing, footwear and shelter. I am not talking about consumption needs in general; I am talking about the capacity to buy physical necessities.

The elimination of the lowest levels of poverty thus emerges as a prime development goal—poverty according to some absolute standard. Peter Townsend and others who support a relative concept of poverty describe those in any society as poor if they are unable to:

"participate in the activities and have the living conditions and amenities which are customary in that society. These activities and customs have to be described empirically. In addition to food and clothing customs, they include, for example in the United Kingdom, such things as birthday parties for children, summer holidays and evenings out." This concept of poverty as social deprivation implies that the poverty standard would rise as living conditions improve, and indeed that poverty could never be eliminated, except perhaps by making the distribution of income very equal. Surely in the Third World "poverty" has more meaning than this.

Another basic necessity, in the sense of something without which personality cannot develop, is a job. This does not necessarily mean paid employment: it can include studying, working on a family farm or keeping house. But to play none of these accepted roles and to be chronically dependent on another person's productive capacity, even for food, is incompatible with self-respect for a non-senile adult. It is true, of course, that both poverty and unemployment are associated in various ways with income. But even a fast increase in per capita income is in itself far from enough, as the experience of many economies shows, to reduce either poverty or unemployment. In fact, certain processes of growth can easily be accompanied by, and in a sense cause, growing unemployment.

The link between per capita income and the numbers living in poverty is income distribution. It is a truism that poverty will be eliminated much more rapidly if any given rate of economic growth is accompanied by a declining concentration of incomes. Equality should, in my belief, be considered an objective in its own right, the third element in development. The inequalities to be found today are objectionable by any religious or ethical standards. Inequality of income is associated with other inequalities, especially in education and political power, which reinforce it.

The questions to ask about a country's development are therefore: What has been happening to poverty? What has been happening to unemployment? What has been happening to inequality? If all three of these have become less severe, then beyond doubt this has been a period of development for the country concerned. If one or two of these central problems have been growing worse, especially if all three have, it would be strange to call the result "development," even if a country's average per capita income has soared. This applies, of course, to the future too. A plan which conveys no targets for reducing poverty, unemployment and inequality can hardly be considered a development plan.

Of course, the true fulfillment of human potential requires much that cannot be specified in these terms. I cannot spell out all the

other requirements, but two important ones may be mentioned: adequate educational levels (especially literacy), and belonging to a nation that is truly independent in that the actions of other governments do not largely predetermine one's own government's decisions. As undernourishment, unemployment and inequality dwindle, these educational and political aims become increasingly important objectives of development.

I must make it clear, however, that national income is not totally meaningless just because it is an inappropriate indicator of development. It has significance as a measure of development potential. Suppose that two countries start a decade with the same per capita income and one grows faster than the other over ten years. The increase in income in the former goes entirely to the rich, and because growth has been due to highly capital-intensive techniques, unemployment rates remain unchanged; while in the latter, growth has been slower but has meant lower unemployment and thus benefited the poorest class. Then, although the country with faster growth has, on my criteria, developed less, it has achieved greater potential for developing later.

The fiscal system could bring about development more rapidly the greater the income available for transfer to the poor. Moreover, a fast growth rate implies a greater savings capacity, which could more easily mean true development in the future. Indeed the faster-growing country may well already have a higher level of investment per capita; and if this investment is in agricultural projects which will raise food production and provide more rural employment, or in rural schools, genuine development could already be foreshadowed for the future. From a long-term viewpoint, then, economic growth is for a poor country a necessary condition of reducing poverty. But it is not a sufficient condition. To release the development potential of a high rate of economic growth depends on policy.

Priorities in the Social Sciences

It may help us to withstand the strong intellectual attraction of the national income as a yardstick of development if we look back a little. By about 1950 the great economic problems had been brought largely under control in the industrial countries. Unemployment had been reduced to historically very low levels; absolute poverty in the sense I use the word had been largely eliminated, while taxation and educational advances had reduced economic inequalities. With the easing of the big problems and the progress of postwar expansion, economists turned their attention to innovations in professional techniques. However, we now see that even in the industrial countries basic economic problems had not really been cured. Their social scientists, notably in the United States, have been rediscovering their

own poverty. Moreover, unemployment has recently grown, and inequality may well have done so too.

But the fundamental problems have never even started to disappear from sight in most of the Third World. In Africa, Asia or Latin America, development had been limited on any of the three economic criteria until 1950. Since then, there has been some reduction in the proportion of people living in poverty. But it has recently been estimated by Francis Keppel that seven out of every ten children in the world are "affected by the apathy typical of chronic protein deficiency, an apathy which translates into diminished learning potential;" the fraction among many countries of the Third World, such as India, must of course be higher. Unemployment seems to have grown, judging from the countries for which data are available. It is probable, though data are extremely poor, that in most countries inequality has not been reduced; in many, it may well have increased.

Conceptual and Measurement Problems

One defense of the national income is that it is an objective, value-free indicator. Yet it is in fact heavily value-loaded: every type of product and service is assigned its own particular weight (many being zero). This weight is mainly determined by market forces which reflect the country's income distribution. A familiar question in economics—how adequately income measures demand when its distribution is unequal—gets additional point when the distribution is as highly concentrated as it is in many of the countries of the Third World. Another question—how objective demand is when it is partially determined by salesmanship—appears even more cogent when tastes are to some extent imported from abroad. But, in addition, official policies, e.g., fostering import substitution by controls, often increase the prices of luxuries much more than of necessities. There are often egalitarian reasons for such policies, but the outcome is paradoxical: increases in production of luxuries count much more highly in the estimation of rates of economic growth than they do in industrial countries. While prices of staple foods and clothing may be comparable between poor countries and rich, perhaps lower in the former, prices of cars, refrigerators, etc., are several times as high. The absurd consequence may be that in a country where there is serious poverty, an additional car counts for more than ten tons of rice.

It has been argued on behalf of national income as a development indicator that it could at least be quantified. So far as the Third World is concerned, much of what the tables of national income accounts ought to cover falls outside the scope of official statistics. This applies to output of domestic foodstuffs, especially subsidiary

crops which come under the general heading of market gardening, along with fish, forest products, etc. Extremely rough methods of estimation are often used, much of the output being assumed to rise in proportion to the increase in rural population, an increase which is in turn assumed to be some constant arbitrary rate in the absence of registration of births and deaths, or data on migration. Secondly, we know very little about construction in the countryside by the farming community itself; this apparently amounts to a good deal if one takes account not only of building houses, but also clearing land, digging wells and ditches, constructing fences and hedges, etc. Thirdly, there are practically no basic data on domestic service and other personal services, even those which are remunerated. We should ask national income estimators conceptual questions such as: which of the activities a farm family does for itself without payment, such as haircutting for example, have you included in the national income? And why? And practical questions such as: how many fish were caught in Province A in the years concerned? How many huts were constructed in Province B? How many barbers worked in Province C? And how do you know?

I have examined the worksheets in about 20 countries; the blunt truth of the matter is that when one takes into account the difficulties of allowing for inventory changes and depreciation, and of deflating current-price data, the published national income series for a large number of countries have very little relevance to economic reality. In many countries, a statistician could produce from the meager basic data series showing the real per capita income either rising or falling. Decimal places are fantasy. Some series are in a way more misleading than sets of random numbers because they appear to have a significance. It might be argued that the national income figures are at least available, whereas data on poverty, unemployment and inequality are very scrappy. This is, however, the result not so much of basic differences in estimation possibilities as of attitudes to development. The type of data collected reflects priorities. What work is done by a statistical office depends in practice partly on what its own government demands, partly on the advice it receives from various UN agencies, especially the UN Statistical Office. As a realization of the importance of social problems spreads, statistical offices will put less weight on national income estimation, more on preparing appropriate social indicators.

I do not deny that there are conceptual problems with development indicators. The difficulties in assessing poverty standards, or even minimum nutritional standards, are well known. For a household these should reflect the ages and also the physical activities of its members. Moreover, many households which can afford to exceed the nutritional minimum expenditure will not in fact do so, because they spend their money on things other than nutrition. There are

other measures of poverty. One is the infant mortality rate (this reflects the effectiveness of health services, as well as diet, housing, etc.). Data on protein consumption, and the incidence of diseases of undernourishment such as rickets, are further clues on development, as are the height and weight of children. However, they are only clues, and may be misleading if used to compare nations of very different genetic stock, dietary habits, etc. The best procedure is for each country to define for itself a minimum income standard, taking account of various possible factors, which it intends that all its people should attain at some future time. When, as in India, an official poverty line has been established, the resultant estimates of the proportion of households with incomes below a specified poverty line are not without meaning. However rough, they have some significance as a yardstick for measuring development over time.

Unemployment is notoriously difficult to define in non-industrial societies. An urban unemployed person can be roughly identified by the usual questions designed to reveal the last occasion when work was sought. In addition there is involuntary short time working, and people are more or less idle, at least for most of the day, in jobs which are more or less fictional (from superfluous posts in government to shining shoes). The volume of this is hard to measure; so is disguised rural underemployment because of seasonal variations in activity. One needs much more detail by sector, by region, by sex, by age, by educational qualification, to throw light on the nature of unemployment and underemployment in any country and on the attitudes of people to work.

Inequality can be measured in many ways—by size, race, region or by factor shares. All have their uses for different purposes, and all are interconnected. They are also all limited in one important respect, namely that there are other sources of inequality than income. One's standard of living may be affected by access to free cars, for example. (An ambassador may well have a higher level of living than somebody with ten times his salary.) It also depends on access to public services such as health. Even concentration of income by size can be measured in many ways. If one wants a single measure, the Gini coefficient, derived from the Lorenz curve (showing cumulative proportions of income received by cumulative proportions of recipients), is probably still the most useful, for either income or wealth. But, if we are mainly concerned with inequality as an indicator of poverty, a more meaningful measure may be to express the average income of the lowest percentage group one is concerned with (e.g., the lowest 10 percent) as a fraction of the median. Of course, all these measures of distribution raise the same conceptual problems as national income measurement—for example, where to draw the boundary between activities which are marketed

and those which are not. In addition, such measures take no account of the price structure, which may well affect the concentration of real income—an important point in countries where protection creates large profits.

All in all, however, the conceptual problems of these indicators do not seem to be more formidable than those of the national income—we have just grown accustomed to ignoring the latter. And many of the practical problems are the same as those that face the national income estimators. But indicators of any of the elements of development I have mentioned also require supplementary information. Thus to measure the proportion of the population above a poverty line one needs to know how many people share each household income (and whether they are males or females, adults or children). To measure unemployment meaningfully, one needs to know what jobs people would be prepared to take at what income, and what hours they work. But we must not be diverted by such technical problems from attempting the assessment which really matters. There is one possible source for all of these measures: household surveys designed to provide them. These can yield the necessary cross-classifications by region, race, income, etc. The systematic development of the information required to study trends in poverty, unemployment and income distribution in any country requires pilot surveys in depth to clarify the conceptual issues in their local context and guide the construction of indicators. This is best achieved if a permanent sampling organization, such as India has in its National Sample Survey, is established to collect the necessary information professionally, systematically and regularly.

The Interrelations of Indicators

What is proposed is that development be measured as progress in terms of three indicators—poverty standards, unemployment and income inequality—with a recognition that the potential for such progress depends on aggregate income growth. The question of how to weigh and compare these different indicators is a major problem. It is impossible to explore all its aspects here, but it may be useful to indicate some major possibilities of inconsistency and how serious these seem to be.

On the face of it, there is a strong causal interrelation between the three leading indicators. Development on any of them implies, or helps bring about, or may even be a necessary condition for, development on one or more of the others. To reduce unemployment is to remove one of the main causes of poverty and inequality. A reduction in inequality will of course reduce poverty, other things being equal. But are other things equal? Does lowering the concentration of income imply a slower rate of economic growth—and

growth is in the long run a necessary condition for eliminating poverty. And if so, would slower growth impair employment prospects? There is a well-known, indeed classical, argument that inequality generates savings and incentives and thus promotes growth and employment.

I find the argument that the need for savings justifies inequality unconvincing in the Third World today. Savings propensities are after all very low precisely in countries with highly unequal distributions; the industrial countries with less concentration of income have much higher savings propensities. The rich in most poor countries tend to have extremely high propensities, not merely to spend, but to spend on goods and services with a high foreign exchange content, and for countries suffering from an acute foreign exchange bottleneck this is a major obstacle to development. It is true that import demand can be held in check by administrative controls, but this leads to the elaboration of a bureaucratic apparatus which is expensive and which in some countries becomes riddled with corruption. In fact, the result of import control is often to create a protected and highly profitable local industry, which itself depends heavily on imports of intermediate products and capital goods, and remits abroad a large flow of money in profits, interest, royalties, license fees and service charges of various sorts. In any case, in a highly unequal society personal savings often flow abroad, or go into luxury housing and other investment projects of low priority for development or even for growth.

The argument that only inequality can provide the incentives that are necessary is also of limited validity in a country where there are barriers of race, class or caste to advancement. Still, we cannot dismiss it out of hand. The needs for private entrepreneurial talent are important in countries relying on growing exports of manufactures, as many do. These depend heavily on the emergence of businessmen with the drive to penetrate foreign markets. All countries depend in some degree on the appearance of progressive farmers. Will these emerge without financial rewards on a scale that will make nonsense of an egalitarian policy? Are rising profits of companies, especially foreign companies, an inevitable feature of growth in many countries? Or are we exaggerating the importance of financial incentives? Can other non-financial rewards partially take their place? Can social incentives be developed to a point where people will take on such tasks with little or no individual economic reward, as the government of China is trying to do? The compatibility of growing equality and rising output and employment has recently become doubtful for another reason. Can the people who are professionally necessary for development be kept in the country if they earn only a small fraction of what they could earn elsewhere? How much unemployment will their departure involve

when their labor is complementary to that of the rest of the labor force? What are the costs in terms of human welfare and even efficiency if they are prevented from leaving?

On the other hand, there are also serious reasons for questioning the compatibility of inequality and the growth of income and employment. Will production rise rapidly if much of the labor force is too badly nourished for full manual and mental work and cannot afford to buy manufactures? Can the government obtain the cooperation of the population in wage restraint and in other ways that are necessary for development if there is visible evidence of great wealth which is being transmitted from generation to generation, so that the wage earner sees his children and his children's children doomed indefinitely to subordinate positions; or if there is little prospect of reducing unemployment? Can political leaders under such circumstances mobilize the energies of the population? I do not pretend to know the answers to this complex of questions. All I would say is that such questions have usually been ignored in the past, leading to a failure to appreciate the damaging consequences of inequality.

Implications for Planning

The most important use of these development indicators is to provide the targets for planning. The realization that the national income is in itself an inadequate yardstick of development implies a need for substitute targets involving poverty, employment and income distribution. This difference in approach is more profound than it seems. Formerly the basic technique consisted in extrapolating past trends and choosing investment patterns that would produce an acceptable increase in national income in a five-year period, tacitly assuming many constraints as given. Thus consumption patterns were projected in a way that assumed little or no change in income distribution or in tastes or attitudes. Now we must try to envisage what might be a satisfactory pattern at some time in the future, in terms not only of production and employment structures, but of the patterns of income distribution, consumer demand and jobs, and then work backwards, to see if there is any plausible path for getting there.

Must the econometrician search for planning models with multiple objectives in response to this challenge? Perhaps the task is much simpler: to lift every family above a poverty line, based on food requirements, bare minimum though it may be. To achieve this implies the elimination of unemployment and thereby a reduction in inequality. It also implies setting target incomes for various sizes of families and working out what measures would be needed to achieve these (the measures may include not only employment creation, but also welfare schemes such as special food programs for children, pensions, etc.). The necessary investments both to produce the com-

modities needed and to supply the requisite jobs would then have to be estimated and provided for. The final step is to estimate what measures need to be taken in policy areas such as taxation and banking.

This approach raises statistical problems. In the first place, sufficiently detailed income and expenditure studies are rarely available; even if they were, there would be problems of relating poverty lines to household composition, referred to above. Converting targets into policies raises further problems because of the many different influences on the income of the poor and because typically there is no machinery for straightforward fiscal redistribution. But the approach is nevertheless worth pursuing.

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Social Values and the GNP

The Editor

The kinds of objections voiced by Seers in the preceding article to the use of national income or gross national product (GNP) as a measure of developmental progress, or as a goal of development, are currently heard in many quarters. President MacNamara of the World Bank Group, among others, has pointed to the income inequalities and growing unemployment that often accompany a rise in GNP as matters of serious concern. Some have stressed the need to consider such issues as environmental pollution resulting from industrial growth, the importance of malnutrition and health service access, and other aspects of welfare that do not enter into GNP tables. Others have emphasized distortion in GNP values, e.g., those resulting from effects of monopoly or protectionism in price formation. There is no sign of consensus on any single substitute for GNP in sight, though there is some convergence of views on the need for a standard that would incorporate certain kinds of social values—the concern for the poor and underemployed.

The use of increase in the GNP as a measure of national progress is hard to replace because it performs several closely related functions at the same time. It refers to an entity—the total annual output of goods and services in a country—which all can agree is important. Other things may be thought more important, but it is hard to get a consensus on them. Maximum production may be too materialistic as an ultimate goal, but what then is wanted? A GNP total ignores the share in it of the poor, but it does count the goods that are available to be consumed. (It does this best for items entering the market; farm-consumed food is difficult to estimate, and home services are generally ignored.) By measuring total output, the GNP represents the total material and service resources

of a society to use in serving whatever mixture of purposes it may choose.

Second, the GNP provides a single measure that can combine many unlike things in a widely acceptable way—i. e., by adding up their money values. The total domestic output, with imports added and exports deducted, is also the total of private and public incomes, of consumption plus investment. As such it not only provides the simplicity of a single standard but utilizes in its components a defensible measure of welfare for individuals and groups in the nation. For example, nutrition may be thought more important than money values, but nutrition is a mixture of calories, proteins, vitamins, essential minerals, etc., which there is no obvious way to combine, and nutrition is only one of many elements that should be considered in assessing welfare. Synthetic combinations of index values have been made up for various purposes, no one of which seems to provide as clear and comprehensible a measure as income.

A third and major virtue of the GNP is that it is associated with a large body of analytical wisdom and practical experience in how to raise it. If GNP growth is accepted as a goal, there is a lot known about how to move toward it—not enough to guarantee success, of course, but far more than is known of how to progress toward alternate goals. This is true at the general policy level, where there are some areas of controversy in economic growth theory but nevertheless large areas of consensus. At another less controversial level, there are well articulated methods for judging among new projects for investment in accordance with their estimated contributions to GNP. It is difficult to imagine equivalent procedures for discriminating among many complicated alternatives to estimate their relative contributions to other goals.

The points so far mentioned are certainly of pragmatic importance: consensus on the importance of GNP, its simplicity and cogence as a welfare measurement, and the technology of its guidance for decision-makers. But there is a further dimension where something more sweeping is claimed. Economics, it is said, is the science of allocating scarce resources to achieve maximum satisfaction of a society's diverse needs and wants, whatever these may be. The relative intensities of wants will be expressed in willingness to pay for goods and services (whatever people may say about motivation, their actual willingness to sacrifice income is the best test); the relative scarcities will show up as costs; so a competitive market will efficiently match up wants and scarcities, especially as both of these will change through time and call for innumerable flexible adjustments. GNP is not in itself a measure of want-satisfaction, but increases in real GNP values should indicate increases in overall welfare—subject only to distortions in

value from imperfect markets. This interwoven complex of ethical, scientific and practical claims has been, on the one hand, a strong magnet of attraction for intellectuals and practitioners alike, and, on the other hand, a source of varying degrees of irritation, skepticism, and even anger on the part of critics. The weighting of the welfare of rich and poor by their incomes is a prime objection. Attempts to "dethrone" GNP are sometimes seen as attacks on the mental framework of the economics profession. Perhaps it is a family quarrel: some of the sharpest attackers are economists, as are the most sturdy defenders. But there are extra-familial consequences; the current question would seem to be whether inadequacies in the development indicator are in some way preventing economists from doing the job they should be doing in developing countries that face unemployment and distributive problems.

No kind of technologist, including economists, can be expected to solve a country's problems unless there is a will to do so. But suppose a will to tackle problems of employment and poverty exists to some degree in a government with the power to undertake major change. Such a regime may be considering employment projects, land reforms or other means of shifting income distribution. The political leaders will need to find ways of bringing about what they desire, given the country's resources as they find them. The economist must ask them to define their purposes with sufficient clarity that he can work out the implications. By seeking such clarification he may help other people to sharpen their perceptions of purpose, and he can reveal incompatibilities among purposes; then he can try to define the trade-offs and costs among economic policy alternatives with the thoroughness they deserve. The direction of such judgments will be affected by the economist's priorities: if political leaders are clear and determined in their purposes (for better or worse) the economist's role may be circumscribed, but if the policy direction is fuzzy or vacillating, or if leaders are somewhat open to suggestion, the economist's advice could matter. The success of a crusader for the underdog depends on far more than a formal adherence to development indicators, but Seers would at least give him a banner to fly and a general plan for his campaign as he marches into poorly mapped territory.

If there is to be a fruitful interaction of economists and policy makers in working on these problems, there will be various policy experiments, new kinds of data will be collected, and there should be a process of theory-making combined with lessons from experience yielding increments to general knowledge. Without trying to anticipate the contents of such a development it can at least be expected that the road will be rough and troubled, for the problems are stubborn and resistant to speedy remedy. Returning to the narrower question of development measures, it will not be easy for govern-

ments to accept the welfare of their poorest groups as the sole or principal measure of their success or failure, as Seers suggests, if only because successes will be of low visibility, and concentration on a country's weakest sector can be depressing. Other groups will not let themselves be ignored in any case, nor should they be forgotten. But this is not an argument against giving the lower strata a higher priority in plans and policies. If economists want a rationale for shifting priorities in this direction, they may find wider acceptance if they try to adapt the GNP and associated measures to the purpose without making a full-scale attack on this very useful yardstick.

Within a defined general policy framework, the economist can proceed to estimate which activities, embodied in specific possible projects, will best contribute to the regime's purposes. Project appraisal, beginning with the traditional banker's investigation of a new activity for which he is asked to contribute a loan that may or may not prove to be profitable, has been expanding toward the incorporation of other criteria not encompassed by profitability. International financing agencies, which deal with governments rather than firms, have evolved ways of judging relative costs and benefits to an economy as a whole. This kind of analysis is not new, but its modifications in the usual considerations bearing on enterprise profit have been cautious—understandably, since much money is affected by these judgments. This kind of "social accounting" might be employed for several kinds of purposes. For example, if reducing unemployment is an important social value, labor costs may be valued below existing wage levels so that projects using more of particular kinds of labor will show higher benefit/cost results than alternative labor-saving projects—this is the usual method. There are other possible methods, e. g., the use of multiplier effects added to benefits. If income equalization is an objective, then the estimated incomes of some groups (the ones to be favored) can be valued upward by a coefficient in the calculation, and incomes of other groups similarly lowered. This method can also be adapted to accommodate other considerations not normally found in profit calculation. For example, if environmental damage is feared, it can be incorporated as a cost when comparing the benefit/cost relations among project possibilities. Nutritional values could be given an added benefit coefficient. Luxury goods or other undesirable products (once defined) could be reduced in value in the benefit calculation.

Similarly—and here we are on new ground, only beginning to be discussed—the measures of national social values in the GNP total itself could be revalued. If the welfare of particular groups, such as the poor, is to be of major concern, their per capita incomes could be more heavily weighted in the total. On the product side,

to take Seers's example: it may be upsetting to find that an automobile is worth as much as 10 tons of rice; but the car is not worthless, so how many kilos of rice should be its social value equivalent? Once one starts tinkering with market values in estimating GNP, one opens a Pandora's box of unsettling issues that may be debated for years. Among others: the income and production totals in the GNP will begin to diverge. Economists who are willing to do this take on a chameleon-like quality; their findings could be adapted to anyone's ends, perhaps manufactured for the highest bidder. Policy and project choices may become so involved in ingenious number games that the procedure as a whole could be discredited. But if honestly conceived and conscientiously carried out, this approach might lead to ways in which economics can universalize its ability to guide uses of scarce resources toward achieving society's values.

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